UNITED STATES OF AMERICA:
WAR DEPARTMENT.

MONTHLY WEATHER REVIEW.

(GENERAL WEATHER SERVICE OF THE UNITED STATES.)

MAY, 1890.

CONTENTS.

PREPARED UNDER THE DIRECTION OF
BRIGADIER GENERAL A. W. GREELY,
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List of merchant marine steam and sailing vessels from which International Meteorological reports were received at the office of the Chief Signal Officer, U. S. Army, Washington City, in time to be used in the preparation of the Monthly Weather Review for May, 1890.

Name of vessel.		Captain.
Br.	s. s. Aguan	J. Adair.
	Ailsa	J. W. Morris.
	Alaska	G. S. Murray.
	Alene	E. J. Seiders.
Ger.	Allemannia	Geo. Thiele.
	Aller	H. Christoffers.
Br.	Alpha	S. O. Crowell.
	Alvena	F. McKay.
	Alvo	David Williams.
	Ambassador	J. Aikman.
Ger.	America	A. Kohlmann.
Dtch.	Amsterdam	G. Stenger.
Br.	Amy	H. Nicholls.
	Anchoria	A. Campbell.
	Andean	H. Daniel.
	Anglia	W. Marr.
	Apollo	R. Potter.
	Arizona	S. Brooks.
	Athos	H. Low.
Ger.	Augusta Victoria	A. Albers.
Br.	Aurania	Thos Dutton.
	Baltimore	C. W. Simpson.
	Barrowmore	W. H. Moore.
	Batavia	J. C. Williams.
	Bayonne	J. E. Payne.
	Bede	W. Anderson.
Belg.	Belgenland	E. Bence
Span.	Benita	L. Santaularl.
Ger.	Berlin	A. von Collen.
Br.	Blakemoor	G. Harrison.
Ger.	Bohemia	H. Leithauser.
Br.	Bordierer	F. Manley.
	Boston City	H. W. Pell.
	Bothnia	J. B. Watt.
	Bremerhaven	C. Schmidt.
	Britannic	H. Davidson.
	British Empire	R. Wills.
	British Prince	S. Nowell.
	British Princess	E. H. Freeth.
	Brooklyn City	W. Fitt.
Ger.	Buenos Ayrean	R. Carruthers.
Br.	Buffalo	J. H. Malet.
Ger.	Burgermeister Petersen	A. Reeckmann.
Br.	Bulgarian	R. Leask.
Ger.	California	H. Baur.
Br.	California	R. T. Garvie.
	Californian	J. W. Pickthall.
	Camden	W. N. James.
	Canada	J. Robinson.
	Caspian	R. P. Moore.
Ger.	Cassius	C. Biz.
Br.	Catalonia	J. J. Atkin.
Ger.	Catania	H. M. Franck.
Br.	Cephalonia	W. S. Seccombe.
Am.	Chalmette	J. B. Percy.
Br.	Chelydra	H. Peace.
Am.	Cherokee	H. A. Bearse.
Br.	Chicago	W. Morgan.
	Circassia	J. Hedderwick.
	Circassian	A. McDougall.
	Circe	R. C. Jennings.
Am.	City of Alexandria	J. B. Allen.
Br.	City of Berlin	F. S. Land.
	City of Chester	E. F. Barff.
	City of Chicago	A. Redford.
	City of Lincoln	N. Steel.
	City of New York	Fred Watkins.
Am.	City of Para	J. L. Lockwood.
Br.	City of Rome	H. Young.
Am.	City of Savannah	C. B. Googins.
	City of Washington	J. W Reynolds.
Br.	Coban	R. Fraser.
Am.	Colorado	F. E. Jenkins.
Ger.	Columbia	H. Vogelgesang.
Br.	Counsellor	J. G. Jones.
	Crane	G. J. Robinson.
	Croma	W. B. Lord.
	Cuffe	R. Nicol.
	Cyprus	E. Guild.
	Damaria	G. Dixon.
Ger.	Dania	R. Landerer.
Br.	Denmark	R. S. Rigby.
	Devonia	Jno. Craig.
	Devonshire	A. Purvis.
	Dodona	R. J. Dosser.
Ger.	Dresden	H. Bruns.
Br.	Dunmore	A. J. Campbell.
	Dupuy de Lome	S. Dechaille.
	Earnwell	C. N. Mumford.
	Edenmore	C. A. Watson.
	Egypt	J. Sumner.
	Egyptian Monarch	T. M. Irvin.
Ger.	Elder	H. Baur.
	Elbe	C. Thalenhorst.
Am.	El Dorado	H. J. Byrne.
Fr.	Electrique	P. Charles.
Br.	Elgiva	H. Bermpohl.
	Enfield	W. Bowen.
	Elmville	J. Dove.
Am.	El Monte	R. B. Quick.
	El Paso	H. S. Quick.
Ger.	Ems	R. Sander.
Br.	England	A. F. Heeley.
It.	Entella	V. Bruno.
Br.	Eri King	A. Reddie.
Nor.	Harada	R. Nilsen.
Br.	Ethiopia	John Wilson.
	Etruria	W. H. P. Hains.
	Exeter City	T. L. Weiss.
Am.	Excelsior	H. L. Higgins.

Name of vessel.		Captain.
Br.	s. s. Federation	R. Pinkham.
	France	A. D. Hadley.
Belg.	Friesland	W. G. Randle.
Ger.	Fulda	R. Ringk.
Br.	Furnessia	J. Harris.
	Galileo	W. Magee.
Br.	Gallia	M. Murphy.
Ger.	Gellert	C. Kaempff.
Br.	Germanic	J. G. Cameron.
	Gleadowe	O. H. Bommen.
	Glenfield	J. Newdick.
	Glenorchy	B. Ferguson.
Ger.	Graf Bismarck	W. Topser.
	Grassbrook	H. Schulter.
Br.	Grecian Prince	J. Millburn.
	Greece	A. J. Jeffrey.
Span.	Guido	E. de Lachiondo.
Ger.	Hans & Kurt	Carl Hoelck.
Dan.	Hekla	A. G. Thomsen.
Br.	Helvetia	R. Landerer.
	Hexham	T. D. Adams.
	Hindoo	Jas. Douglas.
	Holland	Thos. Foote.
Ger.	Holsatia	G. Busch.
Span.	Hugo	A. Garteis.
Br.	Iago	F. W. Ouston.
It.	Iniziativa	A. Canzoneri.
Br.	Iowa	E. W. Owens.
Dan.	Island	W. Skjodt.
Br.	Istrian	A. W. Ball.
Ger.	Italia	G. Schmidt.
Br.	Italy	W. Pearce.
	Kansas	A. Fenton.
Ger.	Karlsruhe	F. Kepler.
Br.	Kathleen	R. Mackay.
Ger.	Kerhweider	T. C. Benohr.
Br.	Kepler	M. Flett.
	King's Cross	C. J. Mills.
Fr.	La Bourgogne	E. Franguel.
	La Bretagne	M. de Jousselin.
Belg.	La Campine	E. Smit.
Fr.	La Champagne	Boyer.
Br.	La Flandre	M. W. Ninnes.
Fr.	La Gascogne	Santelli.
Ger.	Lahn	H. Hellmers.
Br.	Lake Huron	P. D. Murray.
	Lake Ontario	H. Campbell.
	Lake Superior	Wm. Seewart.
	Lake Winnepeg	F. Carey.
Am.	Lampasas	M. B. Crowell.
Br.	Lancashire	G. H. Harris.
Fr.	La Normandie	G. Collier.
Span.	Leonora	J. de Alegria.
Am.	Leona	J. Bolger.
Br.	Lero	J. Chisolm.
	Llandaff City	T. H. Gore.
	Lord Clive	P. Urquhart.
	Lord Gough	E. M. Hughes.
	Lord O'Neil	A. Ferris.
Am.	Louisiana	E. V. Gager.
Br.	Lucerne	J. W. Nunan.
	Ludgate Hill	J. Brown.
	Lydian Monarch	T. C. Huggett.
Ger.	Maasdam	A. Potjer.
	Main	M. Moller.
Br.	Maine	H. Bocquet.
	Majestic	H. Parsell.
	Marea	L. O. Moen.
	Marengo	W. Whitton.
	Marmion	J. W. Clark.
	Martello	W. Abbott.
	Mascotte	Jas. Ross.
	Mereddie	D. Young.
	Michigan	S. Walters.
	Minia	Sam. Trott.
Ger.	Minister Maybach	B. Schierhorst.
Br.	Minnesota	R. Griffiths.
	Missouri	T. F. Gates.
	Monkseaton	J. N. Beazley.
Ger.	Moravia	O. Winkler.
	Munchen	A. Jaeger.
Br.	Muriel	G. S. Locke.
	Naranja	J. Silly.
Belg.	Nederland	A. R. Mills.
Fr.	Neustria	P. Verries.
Br.	Nevada	J. A. R. Cushing.
Am.	Newport	W. G. Shackford.
Belg.	Noordland	H. E. Nickels.
Nor.	Norrona	J. J. Isakjen.
Br.	Norseman	R. Williams.
	Norwegian	W. Christie.
Ger.	Nurnberg	H. Engelbart.
	Ocean	A. Voge.
Br.	Oceanic	W. W. Smith.
Am.	Ohio	R. W. Sargent.
Br.	Ohio	P. L. Moore.
	Ontario	W. P. Couch.
Dtch.	Oranje Nassau	T. Sorgdrager.
Br.	Orkla	J. T. Southerland.
	Oregon	H. C. Williams.
	Orinoco	J. S. Garvin.
Am.	Orizaba	J. McIntosh.
Br.	Osmanli	Chas. O'Hagan.
	Othello	H. Mundy.
Hay.	Ozama	C. O. Rockwell.
Br.	Palestine	W. Whiteway.
	Parisian	J. Ritchie.
	Pavonia	A. McKay.
Dtch.	P. Caland	G. Luts.
Am.	Pennsylvania	E. B. Thomas.

Name of vessel.		Captain.
Br.	s. s. Picqua	J. T. Lund.
	Plessey	H. Gillispie.
Ger.	Polaria	F. Schroeder.
Br.	Port Adelaide	C. Hepworth.
Am.	Portia	F. Ash.
	Professor	G. H. Keller.
Br.	Prussian	J. Ambury.
	Prydian	M. Parry.
	Queensmoore	J. Trenery.
Ger.	Rhaetia	W. Kuhlwein.
	Rhein	W. Kuhlmann.
Br.	Rhosina	T. Pearn.
Belg.	Rhyuland	R. Weyer.
Br.	Rialto	J. Akester.
	Richmond	E. S. Clapp.
	Richmond Hill	R. P. Bennett.
	Rochdale	F. D. Tindall.
	Roman	E. Maddox.
Dtch.	Rotterdam	H. C. v. d. Zee.
Br.	Rowena	J. Limond.
Ger.	Rugia	R. Karlowa.
Br.	Runic	T. P. Thompson.
Ger.	Russia	F. Reuter.
	Saale	H. Richter.
Am.	Saginaw	R. B. Kelly.
Br.	Saint Marnock	J. H. C. Boig.
	Saint Ronans	H. Campbell.
	Salerno	B. H. Rogers.
	Samaria	T. Hewitson.
Am.	Saratoga	C. P. Leighton.
Br.	Sardinian	W. Richardson.
	Sarnia	J. Gibson.
Ger.	Scandia	E. Kopff.
Br.	Scandinavian	J. France.
	Scythia	T. Roberts.
Am.	Seneca	F. Stevens.
Fr.	Sepet	J. B. Hourdel.
Br.	Servia	H. Walker.
	Siberian	J. Park.
	Sir Wm. Armstrong	J. McKenzie.
Ger.	Slavonia	H. Schmidt.
	Spaarndam	F. H. Bonjer.
Br.	Spain	W. A. Griffiths.
	State of Indiana	A. Ritchie.
	State of Nevada	J. A. Stewart.
	State of Pennsylvania	A. J. A. Mann.
	State of Texas	G. Williams.
Nor.	Stella	H. Gohde.
Br.	Stockholm City	W. Thompson.
	Strathairly	W. Winn.
Ger.	Suevia	C. Ludwig.
Belg.	Switzerland	J. Ueberweg.
Ger.	Taormina	G. W. Loch.
	Teutonia	C. Schuck.
Br.	Teutonic	P. J. Irving.
	Texan	T. T. King.
	Thanemore	A. J. Baxter.
	The Queen	T. P. Heeley.
	Timor	W. Hodgson.
	Titanic	C. G. Shaw.
Span.	Tomas Brooks	E. F. Canal.
Br.	Toronto	J. MacAuley.
	Tower Hill	R. Bennett.
Nor.	Tordenskjold	C. Uchermann.
Ger.	Trave	W. Willigerod.
Br.	Tresco	J. R. Barber.
	Trojan	W. G. Browne.
	Ulunda	T. Clark.
	Umbria	W. McMickan.
	Utopia	R. Morrison.
	Urbano	T. Kerr.
	Vancouver	C. J. Lindall.
	Venetian	E. Parry.
Nor.	Viking	F. Hastund.
Fr.	Ville de Bonai	Dependant.
Br.	Viola	L. Murray.
	Virginian	W. C. Fry.
Belg.	Waesland	C. H. Grant.
Br.	Waterloo	J. P. Turner.
Dtch.	Werkendam	W. Bakker.
Ger.	Werra	C. Pohle.
	Weser	H. Winter.
Belg.	Westernland	J. C. Jamison.
Br.	Wetherby	J. W. Harrison.
Ger.	Wieland	H. Barends.
Br.	Wild Flower	S. W. Ryder.
	Wisconsin	J. P. Worrel.
	Wyoming	C. L. Rigby.
	United States Naval.	
U. S.	C. S. A. D. Bache	J. F. Moser.
U. S.	S. Despatch	W. S. Cowles.
U. S.	S. Dolphin	Yates Stirling.
U. S.	C. S. schr. Eagre	W. P. Elliott.
U. S.	C. S. Endeavor	A. S. Hall.
U. S.	F. C. S. Fish Hawk	R. Platt.
U. S.	C. S. G. S. Blake	C. E. Vreeland.
U. S.	C. S. Gedney	J. M. Helm.
U. S.	S. Iroquois	J. Bishop.
U. S.	S. Jamestown	B. P. Lamberston.
U. S.	S. Kearsage	H. Elmer.
U. S.	S. Marion	N. M. Dyer.
U. S.	C. & G. S. McArthur	D. H. Mahan.
U. S.	S. Minnesota	G. C. Wiltse.
U. S.	S. Pensacola	A. R. Yates.
U. S.	S. Portsmouth	J. Schouber.
U. S.	S. Thetis	C. H. Stockton.
	Sailing vessels.	
Am.	bg. Abbie Clifford	D. W. Story.
Am.	bk. Alice	W. G. Kair.

UNITED STATES SIGNAL SERVICE

MONTHLY WEATHER REVIEW.

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INTRODUCTION.

This REVIEW is based on reports for May, 1890, from 2,249 regular and voluntary observers. These reports are classified as follows: 166 reports from Signal Service stations; 126 reports from United States Army post surgeons; 5 reports of rainfall observations of the United States Geological Survey in New Mexico; 1,395 monthly reports from state weather service and voluntary observers; 26 reports from Canadian stations; 174 reports through the Central Pacific Railway Company; 357 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine reports through the "New York Herald Weather Service;" monthly weather reports from the local weather services of Alabama, Arkansas, Colorado, Illinois, Indiana, The Iowa Weather and Crop Service, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Meteorological Report of the Missouri State Board of Agriculture, Nebraska, Nevada, New England, New Jersey, New York, North Carolina, North and South Dakota, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, and Texas, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

CHARACTERISTICS OF THE WEATHER FOR MAY, 1890.

The flood along the lower Mississippi river subsided gradually, and much land in the river parishes of Louisiana which was inundated on the 1st was under cultivation at the close of the month. A rise in the Red River caused the overflow of a considerable extent of country in northwestern Louisiana and southwestern Arkansas in the early part of the month. There was a marked rise in the Arkansas River at Fort Smith, Ark., on the 20th and 21st, and at Little Rock, Ark., from the 23d to 25th. At the close of the month the Mississippi River was 0.4 foot above the danger-line at Vicksburg, Miss., and 0.8 foot above the danger-line at New Orleans, La.; most of the country from Bayou Sara to the mouth of the Red River, Pointe Coupee Parish, La., was under water; from the mouth of the Red River to within twelve miles of Monroe, Ouachita Parish, La., a distance of over two hundred miles, the country had been inundated for nearly three months; and from the Red River up the Black River for a distance of eighty miles much of the land was under water. Damaging floods were reported in Ontario, Canada, on the 5th; along the Brazos River, Texas, on the 6th; in the vicinity of Camp Peña Colorado, Tex., on the 15th; in central New York and northeastern Pennsylvania about the 20th; along the Willamette River, Oregon, from the 10th to 20th; along the upper Potomac river about the 26th; in the Island of Cuba about the 29th; and in Fresno and Tulare counties, California, at the close of the month. Floods were also reported along the Carson River, Nevada, and in Scott county, Iowa.

The month was cooler than usual in the central valleys, the Lake region, the Gulf States, and over the eastern part of the country, save at Atlantic coast stations north of the thirty-third parallel. In the plateau regions and adjoining parts of the eastern slope of the Rocky Mountains, and on the Pacific coast north of the thirty-fifth parallel the month was warmer than the average May. The greatest departures below the average temperature occurred in the north-central part of the country, where they exceeded 6°, and the greatest departures above the average temperature occurred at stations in the middle and southern plateau regions, where they were more than 3°. At Keeler, Cal., Winnemucca, Nev., and Albany, Oregon, the mean temperature was higher, and at Marquette, Mich., and Saint Vincent, Minn., it was lower than previously reported for May. The highest maximum temperature reported was 108°, at Florence and Fort McDowell, Ariz.; and at Springfield, Ill., Rapid City, S. Dak., Colorado Springs, Colo., and Fort Stanton, N. Mex., the maximum temperature was the highest ever reported for May. The lowest minimum temperature reported was 5°, at Fort D. A. Russell, Wyo., and the temperature fell to 11° at Breckenridge, Colo. At Atlanta, Ga., Chattanooga and Nashville, Tenn., Sandusky, Ohio, Grand Haven, Mich., Moorhead, Minn., La Crosse, Wis., Colorado Springs, Colo., and Concordia, Kans., the minimum temperature was as low or lower than previously reported for May. Killing frost occurred in South Dakota on the 1st, in upper Michigan on the 3d and 11th, in Ohio on the 2d, 7th, 8th, and 11th, in Nebraska on the 4th and 5th, in northeastern Iowa on the 6th, in Missouri on the 5th, 6th, and 7th, in Kansas on the 7th, in northern Alabama on the 8th, in New Jersey on the 9th, in lower Michigan on the 11th, in North Dakota on the 12th and 15th, in Missouri on the 14th and 16th, in Indian Territory and Kansas on the 16th, and in Oregon on the 21st, 28th, 29th, and 30th. In Ohio killing frost was about three weeks later, in Iowa about one week later, in Alabama about seven weeks later, in New Jersey three to four weeks later, in lower Michigan about two weeks later, in North Dakota seasonable, in Missouri and Indian Territory about one month later, in Kansas about three weeks later, and in Oregon about two weeks later than the average date of last killing frost in the respective states.

The heaviest precipitation occurred on the east-central coast of Florida, where it exceeded fifteen inches, and monthly precipitation exceeding ten inches was reported in central Texas, east-central and northwestern Pennsylvania, central and southeastern Louisiana, northwestern South Carolina, central Alabama, central Georgia, south-central Indiana, and central and south-central Maine. Over a greater part of Arizona, and in southeastern California, southern Nevada, southwestern Colorado, eastern Utah, southwestern New Mexico, and in extreme western Texas no precipitation was reported. The precipita-

tion was generally in excess of the average for the month east of the Mississippi River, and from the middle Pacific coast northeastward over the northern plateau region and a part of the northeastern slope of the Rocky Mountains; in the interior and southwestern parts of the country it was deficient. The greatest departures above the average precipitation occurred from central Alabama southeastward over northeastern Florida, where they exceeded six inches, and the most marked deficiencies were noted from central Wyoming eastward to north-central Nebraska, and in the Panhandle of Texas, where they exceeded three inches. On the middle Pacific coast the monthly precipitation was over two and one-half times greater, in the lower lake region and over the northern plateau region more than one-half greater, and in the east Gulf, south Atlantic, and middle Atlantic states, and New England about one-third greater than the average precipitation for May. In the southern plateau region it amounted to about 5 per cent., on the south Pacific coast to about 15 per cent., and on the northeastern and middle-eastern slopes of the Rocky Mountains, the north Pacific coast, and in the extreme northwest to less than 50 per cent. of the usual amount. At Albany, N. Y., Atlantic City, N. J., Jacksonville and Merritt's Island, Fla., Erie, Pa., Forsyth, Ga., Cumberland, Md., Newburyport and Somerset, Mass., Thornville, Mich., Cooperstown, N. Y., Dyberry, Pa., and Strafford, Vt., the precipitation was the heaviest, and at Moorhead, Minn., Fort Yates, S. Dak., Fort Washakie, Wyo., Concordia, Kans., Fort Stanton, N. Mex., in Arizona, and at Eola, Oregon, it was the least ever reported for May.

For the period January to May, 1890, inclusive, the precipitation in the Ohio Valley and Tennessee, the lower lake region, over the southeastern slope of the Rocky Mountains, and on the middle Pacific coast was more than one-fourth greater than the average, while in the south Atlantic and east Gulf states, the extreme northwest, the Missouri Valley, the northeastern and middle-eastern slopes of the Rocky Mountains, and on the south Pacific coast it was two-fourths to three-fourths of the average for the period named.

Severe electrical and wind storms were extensively and frequently reported in states lying east of the Rocky Mountains, and well-defined tornadoes were noted in McCulloch county, Tex., on the 1st, in Union, Harrison, and Summit counties, Ohio, on the 10th, and in Gratiot county, Mich., on the 24th, the tornado which passed over Akron, Summit Co., Ohio, on the 10th being an especially noteworthy and clearly-described storm. A remarkable aerolite passed in a northeasterly direction over the northwestern counties of Iowa at about 5.15 p. m. of the 2d, and was observed as far north as southern South Dakota and Minnesota. The meteor exploded with a heavy report before reaching the ground, and fragments were scattered over an area of several square miles in the southwestern part of Winnebago county, Iowa, the largest fragment discovered weighing about seventy pounds.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for May, 1890, as determined from observations taken daily at 8 a. m. and 8. p. m. (75th meridian time), is shown on chart ii by isobars. The departure of the mean pressure for May, 1890, obtained from observations taken twice daily at the hours named from that determined from hourly observations, varied at the stations named below, as follows:

Station.	Departure.	Station.	Departure.
Eastport, Me	+.009	Saint Paul, Minn	+.002
Boston, Mass	+.013	Savannah, Ga	.000
New York City	+.013	Saint Louis, Mo	−.003
Philadelphia, Pa	+.008	Galveston, Tex	−.007
Washington City	+.003	Fort Assininiboine, Mont	−.002
Buffalo, N. Y	+.004	Santa Fé, N. Mex	−.012
Detroit, Mich	+.007	Denver, Colo	−.001
Cincinnati, Ohio	+.001	Salt Lake City, Utah	−.005
Memphis, Tenn	+.004	Portland, Oregon	−.016
Chicago, Ill	+.001	San Francisco, Cal	−.014
New Orleans, La	+.003	San Diego, Cal	−.016

For May, 1890, the mean pressure was highest over the south Atlantic states and along the north Pacific coast, where it was above 30.00, the highest mean reading, 30.05, being noted at Roseburgh, Oregon. The mean pressure was lowest over the western and southeastern parts of the southern plateau region, where it fell below 29.80, the lowest mean reading, 29.78, being noted at El Paso, Tex. Over the north-central part of the country, from the Rocky Mountains to the upper lake region, the mean pressure varied from 29.85 to 29.90.

A comparison of the pressure chart for May, 1890, with that of the preceding month shows a general decrease in pressure, save over eastern Nova Scotia and Cape Breton Island, where the mean pressure was slightly higher than for April. The most marked decrease in pressure occurred over the upper lake region, where it was more than .20, and the decrease exceeded .10, save over the eastern part of New England, and at stations on the Pacific coast and in the adjoining part of the plateau region. There was a decrease of about .10 within the area of low pressure over the southern plateau region; a decrease of about .15 in the area of high pressure over the south Atlantic states; and a decrease of .05 to .10 in the area of high pressure over the north Pacific coast.

The mean pressure was below the normal, except over the extreme eastern part of New England, over the Canadian Maritime Provinces, over extreme southern Florida, and from the northeastern slope of the Rocky Mountains southwestward to the south Pacific coast. The most marked departures below the normal pressure occurred from the Red River of the North Valley eastward over the upper lake region and southeastward to northern Virginia, and within a small area extending from east-central Texas over northern Louisiana, where they exceeded .05. In sections where the mean pressure was above the normal the departures were less than .05.

BAROMETRIC RANGES.

The monthly barometric ranges at the several Signal Service stations are shown in the table of miscellaneous meteorological data. The general rule, to which the monthly barometric ranges over the United States are found to conform, is that they increase with the latitude and decrease slightly, though somewhat irregularly, with increasing longitude. In May, 1890, the monthly ranges were greatest in extreme northwestern North Dakota, where they exceeded 1.10, whence they decreased south of east to less than .70 on the coast of southeastern New England, southeastward to less than .40 over extreme southern Florida, southward to less than .50 on the Gulf coast, and southwestward to .30 in southeastern Arizona and on the extreme south Pacific coast, and westward to less than .90 on the Pacific coast north of the Columbia River. Along the Atlantic coast the monthly ranges varied from .39 at Key West, Fla., to .77 at Portland and Eastport, Me.; between the eighty-second and ninety-second meridians, .48 at Tampa, Fla., to .91 at Marquette, Mich.; between the Mississippi River and the Rocky Mountains, .44 at Corpus Christi and Palestine, Tex., to 1.12 at Fort Buford, N. Dak.; in the Rocky Mountain and plateau regions, .30 at Fort Grant, Ariz., to .89 at Rapid City, S. Dak., and .88 at Fort Assinniboine, Mont., and Walla Walla, Wash.; on the Pacific coast, .30 at San Diego, Cal., to .86 at Olympia, Wash.

Chart ii shows that in May, 1890, there was a range in mean pressure of .14 from the east coast of Florida to the north shore of Lake Superior and the upper Missouri valley; a range of .16 from the upper Missouri valley to the north Pacific coast; and a range of .22 from the southern part of the southern plateau region to the extreme south Pacific coast.

AREAS OF HIGH PRESSURE.

Nine areas of high pressure were observed within or near the limits of the United States during the month of May, 1890; compared with the areas of high pressure which were observed during the preceding month they were more numerous but less clearly defined. There has been a slight movement to the northward when compared with the mean track of the areas of high pressure for April, and, as usual with the advance of the season, the barometric changes attending these areas have been less marked. Five of the areas of high pressure observed originated in the region north of Montana and North Dakota; seven passed eastward over the meridian of the Mississippi Valley; six reached the Atlantic coast; while three were traced eastward from the Pacific coast.

The following is a general description of the more important weather conditions attending the transit of these areas of high pressure over the region of observation, as obtained from the regular and special telegraphic reports and reports from voluntary observers:

I.—The month opened with this area of high pressure central over the Dakotas, where killing frosts occurred on the morning of the 1st. The depression which at that time covered the northeast portion of the country moved rapidly to the eastward and was followed by this area of high pressure, which moved over the Lake region to the middle Atlantic states, attended by generally clear weather throughout the Northern States on the 2d. Its easterly course continued, and by the morning of the 3d it had passed to the southeast of Nova Scotia, the barometric pressure increasing slightly during the easterly movement.

II.—This area was at no time central within the limits of the United States, but it appeared on the 2d far to the north of North Dakota, and moved eastward to the north of the Lake region, following the movements of the depression which apparently passed around its southern and eastern quadrants to the Saint Lawrence Valley where it was apparently filled up by the advance of this area of high pressure, and disappeared rapidly during the 4th, and probably did not pass to the eastward of the Saint Lawrence Valley.

III.—The a. m. telegraphic report of the 4th indicated that a belt of high pressure extended across the continent along the fiftieth parallel, and the rapid disappearance of the area previously described was followed by a general increase of pressure over the Rocky Mountain regions, the barometer being highest to the north of Montana on the morning of the 5th, while the cold northerly winds and killing frosts attending this area extended southward over the Missouri Valley to Kansas, and light snows were reported in the upper lake region. The southerly movement of this area continued during the 5th, and on the morning of the 6th it covered the Rocky Mountain regions and extended from Texas to the Dakotas, the barometric pressure being greatest at the extremities of the wave, viz., at Abilene, Tex., and Qu'Appelle, N. W. T., where on the morning of the 6th the barometer read 30.20, while at intermediate points it ranged from 30.10 to 30.16. At the succeeding report these secondary areas had united in the upper Missouri valley, after which the movement was to the southeast, passing over the central valleys on the 7th, the area including within its limits the entire country east of the Rocky Mountains, and drifting slowly to the eastward, reaching the south Atlantic coast on the morning of the 9th. While passing over the Southern States light frosts occurred along the thirty-fifth parallel on the 8th, while the centre of greatest pressure passed over Kentucky, Tennessee, and North Carolina. After reaching the coast line it apparently continued its southeasterly course, and its influence was felt on the coast of Florida until the 11th.

IV.—Was observed to the north of Minnesota on the afternoon of the 9th, when a storm of considerable energy was passing from the lower Missouri valley eastward to the lower lake region. It moved southeastward, covering the Lake region on the morning of the 11th, attended by light frosts and fair weather in the states of the Ohio and upper Mississippi valleys. After reaching the middle Atlantic states it passed eastward over New England and was central near the coast of Nova Scotia on the morning of the 12th.

V.—This area appeared to the north of western Montana on the 11th, when an extended depression covered the plateau and north Pacific coast regions. Its course was first to the southward, after which it was apparently drawn towards the Pacific coast, where it was apparently re-enforced by an area of high pressure from the Pacific. It remained central over the north Pacific coast region during the 13th and 14th, although it extended eastward and included within its limits the entire eastern slope of the Rocky Mountains. It passed southeastward from British Columbia to eastern Montana on the 15th; to eastern Nebraska on the 16th; and to Tennessee on the 17th, where its course changed to the northeast, it being central in New York on the 18th, and last observed to the east of Nova Scotia on the 19th. The barometric pressure at the centre of this area decreased during its easterly movement until it reached the coast line, and when it disappeared off the Newfoundland coast the pressure observed was the same as that attending this area when central on the north Pacific coast, which was three-tenths of an inch higher than it was when central over Tennessee.

VI.—Appeared to the west of the north Pacific coast on the 16th and was central on the coast of Oregon on the 17th. It extended eastward over the plateau and Rocky Mountain regions, remaining central over the northern plateau region during the 18th. It passed eastward to central Nebraska, covering the eastern slope of the Rocky Mountains, and thence to the central valleys which it covered on the 20th. The track of the centre of this area reached its lowest latitude in central Illinois, from which point it bears to the north of east, passing over the lower lake region, the middle Atlantic states, and southern New England, and thence to the Gulf of Saint Lawrence where it was observed on the 22d. As in the case of number v, the minimum pressure attending the centre of this area was observed in the Mississippi Valley, but the increase of pressure during its easterly movement was more marked, and amounted to over four-tenths of an inch during its transit from the Mississippi to the lower Saint Lawrence valley.

VII.—Was also observed to the west of the Oregon coast, where it remained almost stationary during the 21st, 22d, and 23d. The centre shifted to the northward on the 24th and it remained over British Columbia on the 25th, after which it passed rapidly southeastward to western Nebraska on the 26th and to southern Illinois on the 27th, where, as in the preceding case, the centre reached its lowest latitude. The pressure decreased over three-tenths of an inch during the passage of this area from the north Pacific coast to the Mississippi Valley; owing, however, to the depressions to the east and west, it remained clearly defined and moved slowly towards the Atlantic coast, where it apparently divided during the 29th, the principal area apparently moving to the north of the Saint Lawrence Valley, while a secondary area of slight intensity formed over the Southern States and disappeared during the 30th.

VIII.—This area apparently originated to the east of Hudson Bay and north of the Saint Lawrence Valley. It was observed on the 24th, and moved southward to eastern New England on the 25th, after which it remained almost stationary until the 26th and 27th over the Gulf of Saint Lawrence, when it disappeared, owing to the advance of a depression from the middle Atlantic coast.

IX.—Appeared north of Montana on the 30th, and at the close of the month was apparently moving eastward north of Lake Superior. On the afternoon of the 31st it was central to the north of Manitoba, and extended generally over the northwest and upper lake region.

AREAS OF LOW PRESSURE.

Twelve areas of low pressure were observed within the limits of the United States during the month of May, although

in a number of cases secondary disturbances developed which were sufficiently defined to render it possible to trace them in connection with the movement of the principal disturbances, as will be seen on chart i. As compared with the areas of low pressure which occurred during March, the region of storm frequency has shifted to the northward. No well-defined storm passed over the Southern States east of the Mississippi, while during the month of March four depressions were traced over that region. It will also be seen from chart i that barometric depressions were less frequent on the north Pacific coast, while they were much more frequent over the Lake region and extreme northwest. Compared with the preceding month, the areas of low pressure were more numerous, more irregular in their movements, less frequent on the Pacific coast, and more frequent in the extreme northwest. The general tendency of all disturbances originating in the Rocky Mountain regions and to the westward was towards the Lake region, whether the centre was to the north or south of that latitude, while all moved to the north of east after passing to the east of the Lake region.

The following is a general description of the weather conditions attending the areas of low pressure:

I and II.—The 8 a. m. telegraphic report of the 1st indicated the presence of this depression over the central plateau region, while an area of high pressure was located to the northeast of this region, and a storm of considerable energy was passing off the northeastern coast. By the afternoon of the 1st the disturbance traced as number ii appeared in the northern extremity of the barometric trough which extended over the Rocky Mountain regions, while the first depression was apparently forced southward over Arizona by an increase of pressure in the central Rocky Mountain region. During the 2d the pressure decreased in the Mississippi Valley, the more northerly disturbance passing over Minnesota and Lake Superior, developing considerable energy, while the southerly disturbance could scarcely be defined by barometric lines, although the wind direction and heavy local rains indicated the presence of a feeble disturbance in northeast Texas. The more rapid easterly movement of low area number ii carried this storm to the east portion of the upper lake region, and gave a northeasterly direction to the barometric trough which at that time extended southwestward to Texas. Within this extended depression the movements of this area have been traced, although the slight barometric gradient made it impossible to definitely locate the centre of disturbance. It became elongated to the eastward after reaching the Ohio Valley, forming secondary depressions over the middle Atlantic states and New England during the 4th and 5th, while the principal disturbance moved to the upper Saint Lawrence valley. A depression formed in the southern quadrant of this storm on the 6th, near the middle Atlantic coast, and passed northeastward over New England with considerable force. The rains attending these storms were particularly heavy in many localities on the 5th, in Florida on the 5th and 6th, and the rain area included the greater portion of the country east of the Rocky Mountains. Violent winds occurred in the interior of Texas and Mississippi on the 5th after the passage of this storm to the northeastward.

III.—This disturbance was first located in western Colorado on the 8th, although an extended depression existed over the plateau regions during the previous day, the movements of which are indicated on chart i, and while low area number iii may have resulted from this disturbance, its connection cannot be traced from the regular telegraphic reports. On the morning of the 9th two disturbances were well defined, one central over Nebraska and the other over Wyoming. The latter disappeared apparently by decrease of pressure, while the former passed eastward over the Missouri Valley, attended by destructive winds which caused considerable damage to crops in the Dakotas and adjoining states, necessitating replanting in many cases. Tornadoes also occurred in Missouri, and violent thunder-storms in the upper Mississippi valley, attended by heavy rains. On the 10th the centre of disturbance was located in northern Indiana, when very heavy rains were reported from the upper Mississippi valley eastward to New York. Destructive gales were also reported in the Lake region, the wind reaching a velocity of sixty miles per hour at Chicago, Ill., on the 10th. As the disturbance approached the Atlantic coast it became more extended and less violent, passing off the coast during the 11th without causing dangerous winds at coast stations.

IV.—Was observed on the north Pacific coast central over Washington on the 10th, although the greater portion of the plateau regions were included within this depression on that date. It advanced rapidly eastward, reaching western Nebraska on the afternoon of the 11th, when the depression was elliptical in form, covering the regions from the Dakotas southward to the Rio Grande Valley. The barometric gradient to the north over the Dakotas and Montana was greatest, and produced violent northerly winds in that section on the 11th and 12th. The depression was apparently forced to the southeastward, following the general course of the Missouri Valley, by the rapid advance of an area of high pressure from the northwest. It passed over the central Mississippi valley during the 12th, attended by heavy rains as far south as the Gulf States, the rains continuing during the 13th and 14th generally throughout the country east of the Mississippi. The depression passed to the central Saint Lawrence valley on the 14th, where it probably disappeared by increase of pressure.

V.—Appeared to the north of Montana on the 13th and moved rapidly southward towards the Lake region, reaching the upper Mississippi valley on the afternoon of the 14th, thence passing eastward over the Lake region and Ontario, causing moderately strong gales on Lakes Michigan and Erie. It reached the lower Saint Lawrence valley on the 16th, and reports indicate that it ceased to exist while over that section.

VI.—Apparently had its origin to the northward of Minnesota and moved over a course almost parallel to that described for the preceding storm, the centre passing southeastward to Lake Superior, where it was located on the afternoon of the 16th, after which its course changed towards the Saint Lawrence Valley, and as it passed eastward very destructive gales occurred throughout the Lake region, the wind reaching a maximum velocity of fifty-six miles per hour at Alpena, Mich., and forty-eight at Chicago, Ill., and Buffalo, N. Y. It moved northeastward over the Saint Lawrence Valley during the 17th, attended by severe gales, the wind reaching a velocity of sixty-four miles per hour at Montreal, Quebec.

VII.—Appeared north of Montana on the 15th, forming two depressions, one of which passed eastward and disappeared north of North Dakota during the 18th, while the other passed southeastward over the Missouri Valley to Kansas and thence northeastward over the upper lake region during the 18th. After this disturbance reached northern Kansas a second division occurred, one depression moving southward to northern Texas, from which point this secondary disturbance passed northeastward over the Ohio Valley and lower lake region to the Saint Lawrence Valley during the 19th and 20th, leaving, however, a fourth disturbance in the lower Mississippi valley, which moved over the east Gulf states to Georgia, attended by heavy rains. The rainfall was also very heavy in the Ohio Valley and middle Atlantic states on the 19th and 20th. This storm increased in energy after reaching the lower Saint Lawrence valley, and the attending southerly gales extended over the New England coast, while the wind increased to forty miles per hour on the middle Atlantic coast after shifting to northwest.

VIII.—Also appeared north of western Montana, and, as in the preceding case, at once separated, one branch of the disturbance moving eastward north of the stations of observation, continuing this course until it reached the southern extremity of Hudson Bay, where it disappeared on the 23d, while the principal disturbance moved southeast over the Rocky Mountains, reaching southern Nebraska during the 20th, where the course changed to the north of east, and after reach-

ing the Lake region it disappeared, owing to the rapid advance of areas of low pressure to the westward.

IX.—This disturbance apparently developed over the southern plateau region, and moved eastward over Colorado on the 21st and Kansas on the 22d, after which it was apparently forced southward by increased pressure from the Rocky Mountain regions, and disappeared without causing any marked change in the weather conditions of the central valleys.

X.—This disturbance was at no time central within the limits of stations of observation. It was first observed north of Montana on the 22d, and passed eastward north of the Dakotas during the 23d, attended, however, by violent south to west winds in the Northwest. As this storm approached Lake Superior general rains occurred in the central valleys and strong gales in the Lake region, the wind reaching a velocity of fifty-six miles per hour at Chicago, Ill. After the centre of disturbance reached the vicinity of Lake Superior the direction of movement changed to the northeast and the storm apparently passed over the Hudson Bay region. The general rains extended eastward to the Atlantic coast, the heaviest rainfalls occurring in the south Atlantic states, resulting in some damage to growing crops.

XI.—Was first observed north of Montana on the 26th, and, as in the case of numbers vii and viii, which had their origin in the same locality, this disturbance quickly separated, forming secondary depressions, first on the 28th when the principal disturbance was apparently central over North Dakota. Minor disturbances were observed in Colorado, southern Minnesota, and to the north of North Dakota. These secondary disturbances disappeared after the 28th, when the principal disturbance moved southward over the Missouri Valley, covering the eastern slope of the Rocky Mountains and greatly elongated in a north and south direction. It was forced southward by an area of high pressure to the northwestward, and after reaching the west Gulf states it could no longer be defined by barometric lines, although heavy rains occurred over Arkansas near the centre of disturbance on the 31st.

XII.—Was a slight disturbance which developed on the middle Atlantic coast on the 27th, within the limits of a trough of low pressure which extended from Florida to northern New York. It apparently passed off the middle Atlantic coast to the northeastward, increasing greatly in energy as it approached Nova Scotia. Strong northerly and westerly gales occurred on the New England coast on the 28th, when the centre was to the south of, and near, Yarmouth, N. S. Marine reports indicate that this storm continued to increase in energy as it approached the Newfoundland coast during the 29th, and westerly gales were reported on that coast on the 30th and 31st.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.		Duration.	Velocity per hour.	Maximum abnormal changes in pressure in twelve hours, with maximum abnormal changes in temperature and maximum wind velocities in connection therewith.									
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.			Rise.	Station.	Date.	Fall.	Station.	Date.	Miles per hour.	Direction.	Station.	Date
High areas.		°	°	°	°	*Days.*	*Miles.*	*Inch.*			°						
I	1	47	95	40	60	2·0	44	·38	La Crosse, Wis	1	23	Springfield, Ill	1	42	ne.	Chicago, Ill	1
II	2	55	104	52	80	1·5	33	·52	Duluth, Minn	3	30	Huron, S. Dak	3	52	n.	Huron, S. Dak	3
III	5	54	112	31	77	5·0	24	·40	Calgary, N. W. T	5	14	Savannah, Ga	8	40	n.	North Platte, Nebr Sandy Hook, N. J	5 8
IV	9	55	99	43	62	3·0	35	·52	Des Moines, Iowa	10	29	Indianapolis, Ind	10	36	e.	Swift Current, N. W. T	9
V	11	54	113	47	54	8·0	31	·52	Calgary, N. W. T	14	33	Fort Custer, Mont	11	48	nw.	Bismarck, N. Dak	14
VI	16	45	130	48	61	6·0	30	·58	Quebec, Quebec	21	32	Northfield, Vt	20	46	nw.	Huron, S. Dak	18
VII	21	44	128	48	77	8·0	20	·38	Fort Custer, Mont	25	15	Fort Custer, Mont	25	60	nw.	Bismarck, N. Dak	25
VIII	24	50	65	46	65	2·5	15	·22	Yarmouth, N. S	25	17	Father Point, Quebec	26	30	ne.	Quebec, Quebec	25
IX	30	54	108	52	95	1·5	18	·42	Swift Current, N. W. T	29	27	Chicago, Ill	31	40	ne.	Fort Buford, N. Dak	31
Mean	....	51	116	45	70	4·2	28	·44		....	24		....	44	.....		....
Low areas.								Fall.			Rise.						
I	1	38	111	50	62	6·0	26	·26	Baltimore, Md	4	14	Cleveland, Ohio	5	40	ne.	Quebec, Quebec	5
II	1	53	109	45	82	1·5	50	·62	Qu'Appelle, N. W. T	1	26	Bismarck, N. Dak	1	42	ne.	Chicago, Ill	3
III	8	40	107	42	79	2·5	30	·42	Fort Sully, S. Dak	7	24	Rapid City, S. Dak	7	60	ne.	do	10
IV	10	47	120	47	71	4·0	33	·36	North Platte, Nebr	11	16	Valentine, Nebr	11	52	n.	Fort Sully, S. Dak	12
V	13	52	108	49	68	2·5	40	·50	Swift Current, N. W. T	13	22	Rapid City, S. Dak	13	46	nw.	Bismarck, N. Dak	14
VI	15	55	102	51	68	2·0	40	·46	Qu'Appelle, N. W. T	15	17	Green Bay, Wis	16	64	sw.	Montreal, Quebec	17
VII	16	51	113	52	60	4·5	38	·44	Concordia, Kans	17	21	Chicago, Ill	18	44	w.	Father Point, Quebec	21
VIII	19	50	114	52	82	3·5	20	·40	Swift Current, N. W. T	21	15	do	22	54	sw.	Dodge City, Kans	20
IX	20	38	117	39	99	1·5	33	·30	Denver, Colo	21	14	Denver, Colo Cheyenne, Wyo	21	40	nw.	Omaha, Nebr	22
X	22	52	112	53	86	3·5	20	·50	Port Arthur, Ont	24	16	Calgary, N. W. T	22	60	nw.	Bismarck, N. Dak	25
XI	26	50	112	34	99	4·5	20	·58	Calgary, N. W. T	26	21	Fort Custer, Mont	26	56	nw.	Fort Buford, N. Dak	28
XII	27	40	74	46	56	3·0	17	·24	Nantucket, Mass	27	11	Sydney, C. B. I	30	60	ne.	Nantucket, Mass	28
Mean	....	47	108	47	76	3·2	31	·42		....	18		....	52	.....		....

NORTH ATLANTIC STORMS FOR MAY, 1890 (pressure in inches and millimetres; wind-force by Beaufort scale).

The paths of the depressions that appeared over the north Atlantic Ocean during May, 1890, are shown on chart i. These paths have been determined from international observations by captains of ocean steamships and sailing vessels received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

Nine depressions have been traced for May, 1890, the average number traced for the corresponding month of the last five years being ten. The greatest number of depressions previously traced for May was eleven, in 1887 and 1888, and the least number was nine, in 1889. Of the depressions traced for the current month four were continuations of areas of low pressure which first appeared over the North American continent; one apparently originated off the middle Atlantic coast; one first appeared over the southern part of the Banks of Newfoundland; two were first located between the Azores and the British Isles; and one is traced southeastward west of the British Isles. The storms generally pursued irregular paths over mid-ocean and near the British Isles, and but one depression traversed the ocean from coast to coast. Over the western part of the ocean the storm periods were the 5th to 12th, 14th, 17th to 21st, and 25th to 31st, the severest storms occurring south of Newfoundland and over the Grand Banks during the 11th and 12th. Over mid-ocean the weather of the first decade was generally fair and settled, and from the 12th to 15th, 17th, 18th, and 20th to 29th unsettled weather prevailed, the severest storms being reported on the 12th, 13th,

20th, and 21st. Over the eastern part of the ocean unsettled and generally stormy weather continued during the first two decades of the month, the severest disturbances being noted northwest of the British Isles on the 13th and 14th.

Compared with the corresponding month of the last five years the depressions traced over the north Atlantic Ocean for May, 1890, were deficient in number and energy. But one storm of pronounced strength passed eastward from the American continent; there were but four dates on which storms exceeding in force fresh to strong gales were reported over mid-ocean; and, although the weather was generally unsettled over the eastern part of the ocean, gales of marked severity were noted near the British Isles on two dates only.

The movements of areas of high pressure over the north Atlantic during the month were as follows: On the 1st the pressure was high from Bermuda eastward, south of the fortieth parallel, to the Azores. On the 2d an area of high pressure which had advanced from the upper Missouri valley extended from New England to the upper Ohio valley; by the 3d this area of high pressure occupied the ocean south of the fiftieth parallel and west of the thirtieth meridian; during the next six dates it remained nearly stationary south and southeast of Newfoundland. On the 9th an area of high pressure which had advanced from the west occupied the ocean from the south Atlantic coast to Bermuda; by the 10th this area of high pressure had extended eastward and united with the area of high pressure which extended from Newfoundland and Bermuda to the Azores. From the 10th to 21st the pressure continued generally high from the sixtieth meridian to the Azores, the northern limit of this area of high pressure alternately contracting southward and extending northward of the fortieth parallel. On the 21st an area of high pressure which had advanced from the west extended from the lower lakes to the south Atlantic states; by the 22d this area had united with the area of high pressure which extended southward from Newfoundland. During the 23d and 24th there was a rapid decrease in pressure over and near Newfoundland, and on the latter-named date the pressure was generally low over the entire ocean. On the 25th and 26th an area of high pressure extended from New England and the Canadian Maritime Provinces southward to the fortieth parallel, after which it apparently disappeared by a decrease in pressure.

The following are brief descriptions of the depressions traced for May, 1890:

1.—On the 1st the pressure was low south and southwest of the British Isles, and reports of the 2d locate a well-defined area of low pressure about midway between the British Isles and the Azores, with central pressure about 29.65 (753), and fresh gales. By the 3d this depression had advanced to west of Ireland, with a marked decrease in pressure and increase in energy, after which it apparently moved northeast beyond the region of observation.

2.—This depression apparently developed southwest of the British Isles where it was central on the 4th, with pressure falling to about 29.30 (744) and fresh to strong gales. During the next four days the depression remained nearly stationary south of the British Isles, with evidence of considerable energy, after which it passed eastward beyond the region of observation.

3.—This depression apparently developed off the middle Atlantic coast on the 7th, and on the 8th was central in about N. 39°, W. 68°, whence it passed northeastward and on the 9th was central over the Gulf of Saint Lawrence, after which it moved north of the region of observation without evidence of marked energy.

4.—This depression was a continuation of low area iii, which moved from the upper Ohio valley over New England during the 10th. On the morning of the 11th the depression was central off the eastern coast of Nova Scotia, whence it moved rapidly north of east, with a marked increase in energy, to northeast of the Grand Banks by the 12th, where pressure falling to about 29.30 (744) and heavy gales were reported, and thence advanced northeastward to about the twenty-fourth meridian by the 13th, attended by pressure falling below 29.00 (737) and heavy gales, after which it passed north of the region of observation, its disappearance being followed until the 16th by low pressure northwest and north of the British Isles.

5.—This depression was a continuation of low area v, which advanced eastward north of the Gulf of Saint Lawrence during the 16th. On the 17th the depression was central north of Newfoundland, whence it moved rapidly eastward, reaching the thirty-fifth meridian by noon, Greenwich time, of the 18th, and united with a depression central over or near the British Isles on the 19th, its passage being unattended by gales of marked strength.

6.—This depression was central west of Ireland on the 17th, whence it had apparently advanced from the northwest. By the 18th the storm-centre had moved southeast to off the southeastern extremity of Ireland, after which it disappeared over or north of the British Isles. This depression exhibited marked energy and was attended by fresh to strong gales.

7.—This depression was a continuation of low area vi, which passed eastward over the Gulf of Saint Lawrence and Newfoundland during the 18th. By the 19th the centre of disturbance had moved eastward to the fortieth meridian, with pressure falling to about 29.40 (747) and fresh to strong gales, and thence moved eastward to about the thirtieth meridian by the 20th, attended by heavy gales. From the 20th to the 26th, inclusive, this depression remained central between the twentieth and thirtieth meridians, attended by fresh to strong gales, after which it apparently moved westward and united with number 8 east of the Banks of Newfoundland. The irregular course of this depression after the 21st was probably due to high pressure to the eastward. On the 22d there was a gradient of about .60 inch between the tenth and twentieth meridians, and this gradient apparently remained about the same during the 23d; on the 24th it amounted to about .50 inch, and on the 25th and 26th to about .40 inch, and during this period the pressure was apparently high northwest of the British Isles. The high pressure to the east and north, together with the influence of the depression to the westward, had the apparent effect of causing the final and decided westerly movement of the depression after the 26th.

8.—This depression was first clearly defined on the southeast edge of the Banks of Newfoundland by reports of the 25th, where it remained nearly stationary during the 26th and 27th, attended by fresh to strong gales and pressure falling to about 29.25 (743) on the latter-named date; it moved slowly northnortheast by the 28th with a marked increase in energy, and on the 29th was central northeast of the Grand Banks, attended by heavy gales, after which it recurved to the southwestward and united with a depression which had moved south of east from New England to the fortieth parallel. High pressure to the eastward apparently deflected this depression to the westward after the 28th.

9.—This depression was a continuation of low area xii, which passed off the New England coast during the 28th and moved thence east-southeast to the fifty-sixth meridian by the 29th, with pressure falling to about 29.20 (742) and heavy gales. By the 30th the centre of disturbance had moved northeastward over the Grand Banks without evidence of loss of energy, after which it disappeared north of the region of observation.

OCEAN ICE IN MAY.

The table below shows that for May, 1890, ice was reported less than one-half degree south and about seven degrees east of the average southern and eastern limits of Arctic ice for the month, as determined from reports of the preceding seven years. In two years, 1883 and 1887, ice was reported farther south than for the current month, and in 1887 the southernmost ice reported for May during the period named, field ice in N. 39° 38′, W. 46° 00′, was noted on the 20th. The easternmost ice reported for the current month, a medium sized and two small icebergs in the position given, was nearly one-half degree east of the easternmost ice reported for May during the

last seven years. For the current month ice was encountered most frequently along and off the southeast and east edges of the Banks of Newfoundland. During the early part of the month Gulf ice was reported between Cape Breton Island and Newfoundland, and a report of the 28th stated that the Straits of Belle Isle were solidly packed with ice. Although enormous quantities of Arctic ice have commonly been encountered over and near the Grand Banks in May, more especially in 1885, 1886, and 1887, the aggregate quantity for the current month probably exceeded that noted for May during the last seven years, and much delay and considerable damage was caused to shipping. The limits of the region within which Arctic ice was reported for May, 1890, are shown on chart i by ruled shading.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for May, during the last eight years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
	° ′	° ′		° ′	° ′
May, 1883	40 30	47 00	May, 1883	45 40	45 12
May, 1884	41 30	47 30	May, 1884	43 30	44 50
May, 1885	40 50	48 15	May, 1885	42 30	40 10
May, 1886	41 36	51 30	May, 1886	48 55	46 13
May, 1887	39 38	46 00	May, 1887	39 38	46 00
May, 1888	41 00	46 00	May, 1888	41 00	46 00
May, 1889	43 07	55 47	May, 1889	49 46	36 48
May, 1890	40 50	50 28	May, 1890	44 12	36 25

FOG IN MAY.

The limits of fog belts west of the fortieth meridian are shown on chart i by dotted shading. In the vicinity of the Banks of Newfoundland fog was reported on twenty-nine dates; between the fifty-fifth and sixty-fifth meridians on twenty dates; and west of the sixty-fifth meridian on seventeen dates. Compared with the corresponding month of the last two years the dates of occurrence of fog near the Grand Banks numbered thirteen more than the average; between the fifty-fifth and sixty-fifth meridians eight more than the average; and west of the sixty-fifth meridian four less than the average. The 14th and 23d were the only dates for which fog was not reported over or near the Grand Banks for the current month. On all other dates, save the 3d, 4th, 12th, and 22d, it occurred attending the approach or passage of areas of low pressure, and on the dates named high pressure with falling barometer and threatening or rainy weather prevailed. Between the fifty-fifth and sixty-fifth meridians fog occurred with the approach or passage to the northward of low-pressure storms, save on the 3d, 4th, and 22d, when the barometer was high and falling, with threatening weather or rain in that region. West of the sixty-fifth meridian fog generally occurred with the passage to the northward of low-pressure storms, save on the 3d, 4th, 12th, and 22d, when high and falling barometer and unsettled weather prevailed in that region. On the 3d dense fog prevailed along the coasts of Massachusetts, Rhode Island, Connecticut, and New Jersey, with south to southeast winds, threatening weather, and a low-pressure storm central over the Lake region. On the 4th dense fog was reported along the coast from Maine to New Jersey with the passage of a low-pressure storm from the Ohio Valley to Pennsylvania. On the 5th dense fog prevailed off the coast from Maine to Connecticut with the passage of a low-pressure storm from New England to the Gulf of Saint Lawrence. On the 6th dense fog prevailed along the New England coast with the passage of a low-pressure storm from the middle Atlantic states to the Gulf of Saint Lawrence. On the 14th dense fog prevailed off the New England coast with the passage of a low-pressure storm over the Canadian Maritime Provinces. On the 15th and 16th dense fog prevailed along the New England coast with the passage of a low-pressure storm over the Saint Lawrence Valley, and the Signal Service observer at New London, Conn., reports that a large fleet of vessels was detained in that port by fog on those dates. On the 19th dense fog prevailed along the coast from Maine to New Jersey with the passage of a low-pressure storm over the Saint Lawrence Valley.

The following are limits of fog-areas on the north Atlantic Ocean, west of the fortieth meridian, for May, 1890, as reported by shipmasters:

Date.	Entered.		Cleared.		Date.	Entered.		Cleared.	
	Lat. N.	Lon. W.	Lat. N.	Lon. W.		Lat. N.	Lon. W.	Lat. N.	Lon. W.
	° ′	° ′	° ′	° ′		° ′	° ′	° ′	° ′
1	44 10	44 25	43 57	44 53	15	40 26	72 36	40 23	70 39
1	39 50	49 50	39 50	47 40	15–16	40 40	69 27	41 30	54 20
1–2	44 07	49 20	43 48	50 27	15–16	41 05	66 30	40 35	71 20
1–2	48 10	48 00	46 32	55 50	16	37 00	73 30	37 05	73 34
2	41 49	59 06	41 52	55 04	16	41 08	50 10	41 14	49 17
2	42 20	49 00	41 41	51 00	16–17	41 50	52 30	41 45	52 50
2	41 59	63 33	42 05	65 34	17	41 05	64 30	40 40	68 48
3	41 52	52 04	42 38	47 56	17–18	41 48	55 40	41 56	64 11
3	41 10	59 40	41 08	60 00	17–18	46 13	40 50	44 40	44 42
3	42 00	67 00	41 45	68 00	18	41 28	64 10	41 25	64 25
3	41 26	49 56	41 26	52 19	19	40 42	71 35	40 38	72 20
4	40 46	60 39	40 49	59 29	19	43 51	44 49	43 40	45 12
4	40 30	71 15	Fire Island.		19	42 04	51 12	42 02	51 37
4	48 38	48 20	48 09	49 41	19	47 09	41 16	47 05	41 36
4–5	42 12	47 44	42 14	52 36	19–20	43 49	53 56	43 44	54 22
5	41 19	59 19	41 14	61 47	20	43 01	63 58	42 40	67 50
5	41 39	51 10	41 46	50 15	20–21	46 28	47 05	46 27	51 28
5–6	40 14	68 00	Sandy Hook.		20–21	43 12	58 51	43 05	60 25
6	47 02	47 00	47 17	46 05	21	46 25	52 41	46 40	54 51
6–7	40 40	66 28	39 43	70 37	21	45 10	45 07	44 57	46 15
6–7	42 21	58 03	42 44	65 50	21–22	45 30	57 00	46 50	60 00
7	48 11	44 01	48 24	43 26	22	41 00	69 12	40 53	69 55
7	42 10	63 35	43 13	60 50	22	46 43	40 44	46 58	41 08
7–8	42 44	49 56	42 45	50 38	22	44 50	45 00	44 40	46 50
8–9	43 15	60 40	45 43	54 39	24	42 15	50 40	42 09	51 00
8–9	43 04	45 36	42 33	48 10	24–25	43 01	48 10	42 12	50 00
9	45 43	41 03	45 30	41 22	25–26	45 42	44 25	45 08	46 57
9	42 48	58 27	42 49	58 55	25–26	48 02	48 58	46 20	55 20
9–10	44 37	44 11	42 39	51 25	26	46 27	46 29	45 53	48 45
11	41 14	66 01	41 07	66 37	27	42 14	48 32	41 54	49 44
11	41 09	50 00	41 10	49 15	27	40 40	70 50	40 35	72 10
12	43 43	52 26	43 59	50 37	27–28	48 20	45 00	47 20	49 00
12–13	41 10	65 48	40 31	70 42	27–28	45 50	59 53	46 17	60 00
13	38 57	71 01	38 57	70 03	27–28	39 35	72 09	39 25	73 11
13	42 53	50 43	42 43	53 10	28–29	42 27	67 50	42 26	68 30
13–14	42 06	61 51	42 00	68 33	29–30	43 46	48 13	43 22	50 27
14–15	40 48	68 11	Sandy Hook.		30–31	43 07	49 40	42 53	50 34
15	43 48	45 45	42 12	50 57	30–31	47 18	43 07	43 52	51 43

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for May, 1890, is exhibited on chart ii by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Signal Service represents the mean of the maximum and minimum temperatures.

The mean temperature for May, 1890, was highest in the lower Rio Grande and the central Gila valleys, where it was above 80°. The mean readings were above 70° south of a line traced from central North Carolina west-southwest to central Mississippi, thence northwest to central Arkansas, thence westward to west-central Texas, thence southward to southeastern New Mexico, thence irregularly westward to southeastern Arizona, thence northwestward over southern Nevada to central California, and thence east of south over California to Lower California. The mean temperature was lowest on the northeast shore of Lake Superior and at the more elevated stations in west-central Colorado, where it fell below 40°, and the mean values were below 50° in the Canadian Maritime

Provinces, eastern and northern Maine, the Saint Lawrence Valley, and north of a line traced from central lower Michigan west-northwest to the British Possessions north of eastern Montana. The mean temperature also fell below 50° over a considerable area in west-central Colorado, and at one station each in central Utah and east-central Nevada.

The mean temperature was generally below the normal in the central valleys, the Lake region, and the Gulf States, and over the extreme eastern part of the country, save at Atlantic coast stations north of the thirty-third parallel. Over the plateau region and adjoining parts of the eastern slope of the Rocky Mountains and on the Pacific coast north of the thirty-fifth parallel the month was warmer than the average May. The greatest departures below the normal temperature occurred in Manitoba, western Ontario, upper Michigan, western Wisconsin, and Minnesota, where they exceeded 6°, and the most marked departures above the normal temperature were noted at stations in Utah, New Mexico, and eastern Arizona, where they were more than 3°.

The following are some of the most marked departures from the normal at the older established stations:

Above normal.		Below normal.	
	°		°
Fort Thomas, Ariz	3.8	Winnipeg, Man	8.0
Salt Lake City, Utah	3.3	La Crosse, Wis	6.6
Somerset, Mass	3.1	Oswego, N. Y	4.2
Albany, Oregon	3.2	Saint Louis, Mo	3.2
Hatteras, N. C	2.8	Vicksburg, Miss	2.3

At Keeler, Cal., six years record, the mean temperature for the current month, 69°.0, was 0°.2 higher than the highest mean temperature previously reported for May, noted in 1889; at Winnemucca, Nev., twelve years record, the mean, 58°.1, was 1°.2 above the mean of 1881; and at Albany, Oregon, thirteen years record, the mean, 61°.4, was 1°.1 above the mean of 1885. At Marquette, Mich., twenty years record, the mean temperature for the current month, 42°.2, was 1°.0 lower than the lowest mean temperature previously reported for May, noted in 1888; and at Saint Vincent, Minn., ten years record, the mean, 45°.2, was 0°.6 lower than the mean for May, 1883.

DEVIATIONS FROM NORMAL TEMPERATURES.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for May for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for May, 1890; (4) the departure of the current month from the normal; (5) and the extreme monthly means for May, during the period of observation and the years of occurrence:

State and station.	County.	(1) Normal for the month of May.	(2) Length of record.	(3) Mean for May, 1890.	(4) Departure from normal.	(5) Extreme monthly mean temperature for May.			
						Highest.	Year.	Lowest.	Year.
Arkansas.		°	Years	°	°	°		°	
Lead Hill	Boone	68.0	8	67.0	— 1.0	74.4	1886	62.9	1882
California.									
Sacramento	Sacramento	64.2	37	62.0	— 2.2	70.2	1865	58.5	1860
Connecticut.									
Middletown	Middlesex	57.1	23	57.1	0.0	61.3	1864	52.4	1861
Florida.									
Merritt's Island	Brevard	75.3	8	76.6	+ 1.3	79.2	1884	70.3	1886
Georgia.									
Forsyth	Monroe	72.8	16	71.9	— 0.9	73.8	1880	69.2	1877
Illinois.									
Peoria	Peoria	64.6	34	61.4	— 3.2	71.4	1881	55.2	1867
Riley	McHenry	57.3	34	53.4	— 3.9	64.4	1881	49.8	1867
Indiana.									
Vevay	Switzerland	65.1	23	64.3	— 0.8	71.2	1880	60.4	1867
Iowa.									
Cresco	Howard	56.6	18	53.2	— 3.4	64.1	1881	49.9	1888
Monticello	Jones	59.5	36	56.6	— 2.9	68.1	1881	51.8	1867
Logan	Harrison	62.3	16	59.7	— 2.5	71.3	1880	56.1	1878
Kansas.									
Lawrence	Douglas	65.1	28	63.2	— 1.9	70.6	1880	55.5	1867
Wellington	Sumner	65.1	11	65.2	+ 0.1	71.1	1880	58.2	1882
Louisiana.									
Grand Coteau	Saint Landry	74.7	7	74.3	— 0.4	75.7	1884	73.2	1889

Deviations from normal temperatures—Continued.

State and station.	County.	(1) Normal for the month of May.	(2) Length of record.	(3) Mean for May, 1890.	(4) Departure from normal.	(5) Extreme monthly mean temperature for May.			
						Highest.	Year.	Lowest.	Year.
Maine.		°	Years	°	°	°		°	
Gardiner	Kennebec	53.4	50	52.4	— 1.0	57.0	1880	49.1	1856
Maryland.									
Cumberland	Allegany	59.9	27	61.4	+ 1.5	67.0	1880	51.1	1866
Massachusetts.									
Amherst	Hampshire	57.1	54	.....	.....	64.2	1880	52.7	1842
Newburyport	Essex	55.5	11	56.0	+ 0.5	61.0	1880	50.2	1882
Somerset	Bristol	58.3	17	61.4	+ 3.1	63.6	1880	51.7	1882
Michigan.									
Kalamazoo	Kalamazoo	57.6	13	55.6	— 2.0	66.0	1881	41.3	1882
Thornville	Lapeer	57.8	13	53.7	— 4.1	66.6	1880	46.9	1877
Minnesota.									
Minneapolis	Hennepin	57.3	25	51.5	— 5.8	63.4	1887	47.9	1867
Montana.									
Fort Shaw	Lewis & Clarke	54.2	21	55.0	+ 0.8	59.8	1869	47.4	1883
New Hampshire.									
Hanover	Grafton	54.4	55	54.3	— 0.1	62.0	1880	48.7	1850
New Jersey.									
Moorestown	Burlington	60.6	26	60.3	— 0.3	68.0	1880	54.4	1882
South Orange	Essex	60.6	18	58.0	— 2.6	66.4	1880	57.3	1885
New York.									
Cooperstown	Otsego	54.6	36	53.4	— 1.2	60.7	1880, '87	46.7	1861
Palermo	Oswego	54.9	36	52.2	— 2.7	60.9	1887	47.5	1867
North Carolina.									
Lenoir	Caldwell	62.5	17	64.9	+ 2.4	67.8	1887	48.0	1881
Ohio.									
N'th Lewisburgh	Champaign	61.4	58	61.8	+ 0.4	68.0	1887	53.0	1838
Wauseon	Fulton	58.8	20	56.1	— 2.7	64.3	1880	52.2	1882
Oregon.									
Albany	Linn	53.2	13	61.4	+ 8.2	61.4	1890	52.4	1880
Eola	Polk	54.0	20	57.4	+ 3.4	59.1	1888	45.2	1880
Pennsylvania.									
Dyberry	Wayne	54.4	23	54.1	— 0.3	64.1	1880	43.7	1865
Grampian Hills	Clearfield	56.5	25	57.2	+ 0.7	65.1	1887	48.8	1867
Wellsborough	Tioga	56.4	11	53.5	— 2.9	68.4	1879	50.5	1882
South Carolina.									
Statesburgh	Sumter	70.3	9	70.2	— 0.1	73.8	1881	65.9	1885
Tennessee.									
Austin	Wilson	69.3	21	66.6	— 2.7	79.2	1887	64.5	1877
Milan	Gibson	67.0	7	66.0	— 1.0	71.4	1887	64.0	1883
Texas.									
New Ulm	Austin	74.3	17	75.6	+ 1.3	77.4	1879	72.0	1885
Vermont.									
Strafford	Orange	55.8	17	54.4	— 1.4	63.0	1887	50.5	1882
Virginia.									
Birdsnest	Northampt'n	65.2	22	66.3	+ 1.1	73.7	1880	60.8	1869
Wisconsin.									
Madison	Dane	56.7	21	52.9	— 3.8	64.2	1870	51.5	1883
Washington.									
Fort Townsend	Jefferson	54.0	18	54.7	+ 0.7	57.0	1889	50.2	1880

MAXIMUM AND MINIMUM TEMPERATURES.

The highest temperature reported by a regular station of the Signal Service was 106°, at Yuma, Ariz., on the 25th. The maximum temperature rose above 100° in the Gila Valley, Arizona, in the Colorado Valley northward into southern Nevada, and in the upper San Joaquin valley, California, and rose to 100° at Rio Grande City, Tex. The maximum temperature rose to or above 90° in the interior of the south Atlantic states, in central Florida, northwestern Louisiana, along the Mississippi River from Saint Louis, Mo., to Dubuque, Iowa, at stations on the eastern slope of the Rocky Mountains south of the fortieth parallel, over the greater part of the southern plateau region, and in the interior of California. The lowest maximum temperatures were noted on the coast of southeastern and extreme eastern New England, and on the extreme north Pacific coast, where they fell below 70°. At Springfield, Ill., eleven years record, the maximum temperature for the current month, 89°, was 1° above the highest temperature previously reported for April, noted for two or more preceding years; Rapid City, S. Dak., six years broken record, 90°, 1° above maximum of 1882; Colorado Springs, Colo., six years record, 85°, 6° above maximum of 1889; Fort Stanton, N. Mex., six years record, 85°, 1° above maximum of 1885. In May of preceding years the highest absolute temperature was generally reported in the middle Atlantic states in 1880 or 1889; in the south Atlantic states in 1878 or 1889; in the west Gulf states, the northeastern and southeastern slopes of the Rocky Mountains, and the southern plateau region in 1886; in the lower lake region in 1879 or 1889; in the extreme northwest in 1880 or 1887; in the upper Mississippi valley in 1874; over the northern plateau region and on the middle Pacific coast in 1887,

and on the north Pacific coast in 1887 or 1888; elsewhere the periods of occurrence were irregular. The following are the highest temperatures reported by Signal Service stations in the several districts for May of preceding years: 97°, at Boston, Mass., in 1880; 96°, at Philadelphia, Pa., and Washington City in 1880; 100°, at Augusta, Ga., in 1878; 98°, at Micco, Fla., in 1889; 98°, at Mobile, Ala., in 1878; 103°, at San Antonio, Tex., in 1879; 111°, at Rio Grande City, Tex., in 1879; 95°, at Memphis, Tenn., in 1879; 95°, at Pittsburgh, Pa., in 1887; 95°, at Toledo, Ohio, in 1871; 92°, at Marquette, Mich., in 1879; 96°, at Moorhead and Saint Vincent, Minn., in 1887; 96°, at La Crosse, Wis., in 1874; 101°, at Fort Sully, S. Dak., in 1874; 96°, at Fort Custer, Mont., in 1886; 101°, at Fort Reno, Ind. T., in 1886; 105°, at Abilene, Tex., in 1886; 116°, at Fort McDowell, Ariz., in 1886; 110°, at Yuma, Ariz., in 1885; 96°, at Winnemucca, Nev., in 1887; 102°, at Roseburgh, Oregon, in 1887; 110°, at Red Bluff, Cal., in 1887; and 101°, at Fresno, Cal., in 1889. The reports of United States Army post surgeons and state weather service and voluntary observers show the following maximum temperatures in states and territories where the temperature was reported 90°, or above, in May, 1890: Florence and Fort McDowell, Ariz., 108°; Eureka Ranch, Kans., 106°; El Dorado Canyon, Colo., and Fort Hancock, Tex., 105°; Barstow, Cal., and Fort Seldon, N. Mex., 104°; Moab, Utah; 102°; Washington, Ark., and Long Pine, Nebr., 100°; Lake Charles, La., Columbus, Miss., and Grant's Pass, Oregon, 98°; Andersonville, Ga., Willow Springs, Mo., and Powder River, Mont., 97°; McLeansborough, Ill., Crandall, and Muncie, Ind., Blakeville, Iowa., Chapel Hill, N. C., at several stations in South Dakota, and at Dyersburgh, Tenn., 96°; Pine Apple, Ala., Alva and Archer, Fla., Tipton, Pa., and Chester and Simpsonville, S. C., 95°; Bucyrus and West Milton, Ohio, 94°; at several stations in Colorado, Lewiston, Idaho, and Richmond, Ky., 93°; Caddo Creek, Ind., T., Benton Harbor, Mich., Watervale, Wash., at several stations in Wisconsin, and at Forts D. A. Russell and Fetterman, Wyo., 92°; at Red Wing, Minn., Nottaway Court House, Va., and Oceana, W. Va., 90°.

The lowest temperature reported by a regular station of the Signal Service was 14° at Moorhead, Minn., on the 1st. The minimum temperature fell below 20° in the valley of the Red River of the North, and was below 30° north of a line traced irregularly south of west from central Maine to extreme north-central New Mexico, in western Colorado, central Utah and Nevada, and on the northeastern slope of the Rocky Mountains. The highest minimum temperature, 69°, was reported at Key West, Fla.; the minimum values were above 60° in extreme southern Louisiana, at Galveston, Tex., and in the lower Rio Grande valley; and were above 50° at stations in extreme southeastern and southwestern Arizona. In May of preceding years the lowest absolute temperature was generally reported in New England in 1882 or 1888; in the middle Atlantic states in 1876; in the south Atlantic states in 1876 or 1877; in the east Gulf states and the middle-eastern and southeastern slopes of the Rocky Mountains in 1880; in the Rio Grande Valley in 1877; in the upper Mississippi valley in 1875; in the southern plateau region in 1884; in the middle plateau region in 1887; and on the south Pacific coast in 1883; elsewhere the periods of occurrence were irregular. At the following-named stations the minimum temperature for the current month was as low or lower than previously reported for May: Atlanta, Ga., twelve years record, 40°, the same as minimum of 1883; Chattanooga, Tenn., twelve years record, 40°, the same as minimum of 1888; Nashville Tenn., twenty years record, 37°, the same as minimum of two or more preceding years; Sandusky, Ohio, twelve years record, 34°, the same as minimum of 1880; Grand Haven, Mich., nineteen years record, 28°, the same as minimum of 1875; Moorhead, Minn., ten years record, 14°, 6° below minimum of two or more preceding years; La Crosse, Wis., eighteen years record, 29°, the same as minimum of 1875; Colorado Springs, Colo., six years record, 30°, 1° below minimum of two or more preceding years; and Concordia, Kans., six years record, 31°, the same as minimum of 1885. The reports of United States Army post surgeons and state weather service and voluntary observers show the following minimum temperatures in states and territories where temperature falling to, or below, 32° was reported: Fort D. A. Russell, Wyo., 5°; Breckenridge, Colo., 11°; Fort Pembina, N. Dak., 12°; Fort Niobrara, Nebr., 14°; Aberdeen, S. Dak., 15°; Crookston and Pokegama Falls, Minn., 16°; Bonanza, Idaho, 17°; Fort Keogh, Mont., 19°; at several stations in Michigan, 20°; Potsdam, N. Y., and East Berkshire, Vt., 21°; Berlin Falls and West Milan, N. H., and Neillsville Wis., 22°; Austin, Nev., and Nesbit, Pa., 23°; Brinkley, Ark., Mayfield, Me., and Garrettsville, Ohio, 24°; Clinton and Fayette, Iowa, Gibson, Kans., Heath, Mass., Hernando, Miss., Highlands, N. C., Beulah and Jordan Valley, Oregon, and Camp Sheridan, Wyo., 26°; Bethany, Mo., Chama, N. Mex., and Mount Pleasant, Utah, 27°; Point Isabel, Ind., 29°; Spartanburgh (J), S. C., and Kingwood, W. Va., 30°; Canton, Conn., 31°; Walla Walla Creek, Cal., Fort McPherson, Ga., Fort Supply, Ind. T., Lawrenceburgh and Waynesborough, Tenn., and Lexington, Va., 32°.

LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather for May, 1890, is shown on chart ii by a line traced from east-central Maine southwestward to southern Vermont, thence irregularly westward to northern Illinois, and thence west-southwest to northern New Mexico. The temperature also fell below freezing over a greater part of Nevada, central Utah, in northeastern California, and southeastern Oregon. Compared with the limits of freezing weather for the preceding month the southern limit for the current month was about eight to nine degrees farther north in the Atlantic coast states; four to five degrees farther north in the central valleys; and four to five degrees farther north in the Rocky Mountain and plateau regions. The western limit of freezing weather was decidedly to the eastward of the limit for the preceding month, more especially over the north Pacific coast and the northern plateau region, where it was about twelve degrees farther east than in April.

RANGES OF TEMPERATURE.

The greatest and least daily ranges of temperature at regular stations of the Signal Service are given in the table of miscellaneous meteorological data. The greatest monthly ranges of temperature occurred from Nebraska northward over the Dakotas and western Minnesota, where they exceeded 60°, whence they decreased eastward to less than 30° on the coast of southeastern New England, southeastward to less than 20° over extreme southern Florida and extreme southern Louisiana, southward to less than 30° on the west Gulf coast, southwestward to less than 30° on the extreme south Pacific coast, and westward to less than 40° on the immediate middle and north Pacific coasts.

The following are some of the extreme monthly ranges:

Greatest.		Least.	
	°		°
Moorhead, Minn	70.0	Port Eads, La	16.0
Dodge City, Kans	64.0	Key West, Fla	18.0
Wilcox, Ariz	62.0	Block Island, R. I	24.0
Fresno, Cal	61.0	Hatteras, N. C	27.0
Baker City, Oregon	58.0	San Diego, Cal	29.0

FROST.

The following is a summary of reports of damaging frost made by regular and voluntary observers of the Signal Service: On the 1st vegetables, crops, and foliage were injured by freezing weather in South Dakota, and ice formed to a thickness of one-fourth inch at Parkston, S. Dak. The frost of the 3d and 11th caused much damage to young plants in upper Michigan. On the 2d, 7th, 8th, and 11th heavy frost occurred in the northern and middle sections and light frost in the southern section of Ohio. On the 4th and 5th freezing weather killed fruit at North Loup, Nebr. On the 6th frost caused some damage to tender plants and fruit in valleys in north-

eastern Iowa, and damaging frost was reported in various parts of Missouri. Frost also occurred at points in Missouri on the 5th, 7th, 14th, and 16th. On the 7th frost killed fruit blossoms, early fruit, and foliage in Decatur and Osborne counties, Kansas. On the 8th frost damaged young vegetables in northern Alabama. On the 9th frost caused considerable damage to tender vegetation in Middlesex, Monmouth, Burlington, Morris, and Sussex counties, New Jersey. On the 11th a severe frost occurred in Michigan; clover and young fruits were damaged, and wheat was reported injured. On the 12th and 15th frost killed tender vegetation in northern North Dakota. On the 14th and 16th frost was very destructive to fruit and garden vegetables in Buchanan county, Missouri, and on the latter-named date frost injured vegetables in western Indian Territory, and Montgomery county, Kansas. On the 21st and 29th frost killed bean and cucumber vines in Multnomah county, Oregon, and the frosts of the last three days of the month severely injured vines and garden vegetables in Morrow and Malheur counties, Oregon.

The southern limit of frost for the month is indicated by a line traced from the coast of east-central Virginia northward to south-central Pennsylvania, thence west of south to central Georgia, thence north of west to northern Mississippi, thence northward to southern Illinois, thence irregularly westward to east-central Arizona, and thence northwestward to central Nevada. On the Pacific coast frost was reported as far south as Jolon, Cal., on the 1st, and at Pasadena, Cal., on the 11th. Compared with the preceding month the southern limit of frost for May, 1890, was about six degrees farther north on the Atlantic coast, one to three degrees farther north in the east Gulf states, about seven degrees farther north in the Mississippi Valley, about six degrees farther north on the eastern slope of the Rocky Mountains, about three degrees farther north in the plateau region, while on the Pacific coast the southern limit of frost was about the same for each month. As compared with the average dates of last killing frost in the respective regions the frost of the 11th in Ohio was about three weeks late, the frost of the 6th in Iowa was about one week late, the frost of the 8th in Alabama was about seven weeks late, the frost of the 9th in New Jersey was three to four weeks late, the frost of the 11th in lower Michigan was nearly two weeks late, the frost of the 15th in North Dakota was seasonable, the frost of the 16th in Missouri and Indian Territory was about one month late, the frost of the 16th in Kansas was about three weeks late, and the frost of the last three days of the month in Oregon was about two weeks late.

TEMPERATURE OF WATER.

The following table shows the maximum, minimum, and mean water temperature as observed at the harbors of the several stations; the monthly range of water temperature; and the mean temperature of the air for May, 1890:

Stations.	Temperature at bottom.				Mean temperature of air at the station.
	Max.	Min.	Range.	Monthly mean.	
	°	°	°	°	°
Boston, Mass	57·3	49·2	8.1	52·5	57·0
Canby, Fort, Wash					
Charleston, S. C	77·8	70·0	7·8	74·6	73·0
Eastport, Me	45·1	39·5	5·6	41·7	47·9
Galveston, Tex	82·0	73·5	8·5	77·4	75·0
Key West, Fla	85·3	79·2	6.1	82·7	78.8
Portland, Oregon	60.0	51·9	8.1	55·7	60.6

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for May, 1890, as determined from the reports of nearly 2,000 stations, is exhibited on chart iii. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for each Signal Service station. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The heaviest precipitation reported for May, 1890, was 16.19, at Hypoluxo, Fla., and the precipitation exceeded 15.00 at Titusville, Fla. Over 14.00 was reported at Caddo Creek, central Texas, over 12.00 in east-central Pennsylvania, over 11.00 in central and southeastern Louisiana and northwestern South Carolina, and over 10.00 in central Alabama, central Georgia, south-central Indiana, central and south-central Maine, and northwestern Pennsylvania. Over a greater part of Arizona, and in southeastern California, southern Nevada, southwestern Colorado, eastern Utah, southwestern New Mexico, and extreme western Texas no precipitation was reported, and in central Washington, western Oregon, northeastern lower Idaho, east-central Wyoming, western Kansas, south-central North Dakota, north-central South Dakota, and south-central Wisconsin less than one-half inch of precipitation fell.

The precipitation was generally in excess of the normal east of the Mississippi River, and from the middle Pacific coast northeastward over the northern plateau region and a part of the northeastern slope of the Rocky Mountains. In the interior of the country from Manitoba southward to the Rio Grande Valley and southwestward to the south Pacific coast the precipitation was deficient. The greatest departures above the normal precipitation occurred from central Alabama southeastward over northeastern Florida, where they exceeded six inches, and at stations on the south shores of Lakes Ontario and Erie, the excess was more than three inches. The most marked deficiencies in precipitation were noted from central Wyoming eastward to north-central Nebraska, and in the Panhandle of Texas, where they exceeded three inches, and over a large part of the middle-eastern and southeastern slopes of the Rocky Mountains, and on the north Pacific coast in adjoining parts of Washington and Oregon the deficiency was more than two inches. Considered by districts the average percentages of the normal in districts where the precipitation was in excess were about as follows: middle Pacific coast, 261 per cent.; lower lake region, 170 per cent.; northern plateau region, 155 per cent.; east Gulf states, 143 per cent.; south Atlantic states, 135 per cent.; middle Atlantic states, 133 per cent.; New England, 132 per cent.; upper lake region, 118 per cent.; Ohio Valley and Tennessee, 108 per cent.; Key West, Fla., 107 per cent.; and upper Mississippi valley, 102 per cent. In districts where the precipitation was deficient the percentages of the normal were about as follows: southern plateau region, 5 per cent.; south Pacific coast, 15 per cent.; northeastern and middle-eastern slopes of the Rocky Mountains, 45 per cent.; north Pacific coast, 46 per cent.; extreme northwest, 49 per cent.; middle plateau region, 51 per cent.; Missouri Valley, 63 per cent.; Rio Grande Valley, 83 per cent.; southeastern slope of the Rocky Mountains, 90 per cent.; and west Gulf states, 96 per cent.

The table of miscellaneous meteorological data for regular stations of the Signal Service and the table of deviations from the normal precipitation for certain stations, as reported by voluntary observers, show that at the following-named places the precipitation for the current month was the heaviest ever reported for May during the respective periods of observation: Albany, N. Y.; Atlantic City, N. J.; Jacksonville, Fla.; Erie, Pa.; Merritt's Island, Fla.: Forsyth, Ga.; Cumberland, Md.; Newburyport and Somerset, Mass.; Thornville, Mich.; Coopers-

town, N. Y.; Dyberry, Pa.; and Strafford, Vt. At Moorhead, Minn., Fort Yates, N. Dak., Fort Washakie, Wyo., Concordia, Kans., Fort Stanton, N. Mex. (no rainfall), Santa Fe, N. Mex., Fort Bowie, Ariz., and Eola, Oregon, the precipitation was the least ever reported for May; and at Lava, N. Mex., Fort Thomas, Whipple Barracks (Prescott), San Carlos, Wilcox, and Yuma, Ariz., no precipitation was reported, and no precipitation occurred in May of two or more preceding years.

In May of preceding years the heaviest precipitation was generally reported in the lower Rio Grande valley in 1885; in the Ohio Valley and Tennessee in 1882; in the lower lake region in 1883; and on the north Pacific coast in 1879 or 1887, and the least precipitation for May was generally reported in New England in 1887; in the west Gulf states and on the middle-eastern and southeastern slopes of the Rocky Mountains in 1886; in the lower lake region in 1877; in the northern plateau region in 1881; and on the north Pacific coast in 1888; elsewhere the periods of occurrence of greatest and least precipitation for May were irregular. An entire absence of precipitation at a majority of stations in the southern plateau region is common in May.

For the period January to May, 1890, inclusive, the precipitation in the Ohio Valley and Tennessee, in the lower lake region, over the southeastern slope of the Rocky Mountains, and on the middle Pacific coast averaged more than one-fourth greater than the normal, while in the south Atlantic and east Gulf states, at Key West, Fla., in the extreme northwest, in the Missouri Valley, over the northeastern and middle-eastern slopes of the Rocky Mountains, and on the south Pacific coast it averaged two to three-fourths of the normal amount for the period named.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for May for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for May, 1890; (4) the departure of the current month from the average; (5) and the extreme monthly precipitation for May during the period of observation and the years of occurrence:

State and station.	County.	(1) Average for the month of May.	(2) Length of record.	(3) Total for May, 1890.	(4) Departure from average.	(5) Extreme monthly precipitation for May.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year
Arkansas.		*Inches*	*Years*	*Inches*	*Inches.*	*Inches*		*Inches.*	
Lead Hill	Boone	6.66	8	4.08	−2.58	10.56	1882	2.04	1886
California.									
Sacramento	Sacramento	0.73	40	2.10	+1.37	3.65	1889	0.00	*
Connecticut.									
Middletown	Middlesex	3.79	28	5.51	+1.72	7.63	1868	0.22	1887
Florida.									
Merritt's Island	Brevard	3.67	13	11.58	+7.91	11.58	1890	0.88	1886
Georgia.									
Forsyth	Monroe	2.92	16	7.31	+4.39	7.31	1890	0.45	1877
Illinois.									
Peoria	Peoria	3.79	34	2.74	−1.05	10.73	1858	0.93	1879
Riley	McHenry	3.79	39	4.33	+0.54	15.46	1851	0.54	1870
Indiana.									
Logansport	Cass	4.87	17	8.32	+3.45	11.13	1858	2.09	1881
Vevay	Switzerland	3.91	25	4.37	+0.46	11.80	1865	0.52	1874
Iowa.									
Cresco	Howard	3.51	18	4.73	+1.22	7.89	1880	0.76	1874
Monticello	Jones	3.60	35	4.48	+0.88	7.97	1858	0.76	1874
Logan	Harrison	4.41	24	6.29	+1.88	11.00	1877	1.10	1874
Kansas.									
Lawrence	Douglas	4.25	24	5.14	+0.89	8.27	1889	1.12	1887
Wellington	Sumner	4.74	11	2.97	−1.77	9.37	1881	0.88	1886
Louisiana.									
Grand Coteau	St. Landry	5.82	7	3.57	−2.25	14.03	1884	0.21	1889
Maine.									
Gardiner	Penobscot	3.70	51	7.84	+4.14	11.76	1850	0.36	1852
Maryland.									
Cumberland	Allegany	3.05	18	7.13	+4.08	7.13	1890	0.30	1875
Massachusetts.									
Newburyport	Essex	3.71	11	6.08	+2.37	6.08	1890	.....	.....
Somerset	Bristol	3.59	17	5.81	+2.22	5.81	1890	1.08	1880
Michigan.									
Kalamazoo	Kalamazoo	4.10	14	4.66	+0.56	6.38	1883	1.44	1885
Thornville	Lapeer	3.39	13	5.87	+2.48	5.87	1890	1.37	1881
Minnesota.									
Minneapolis	Hennepin	3.44	24	4.16	+0.72	6.21	1879, '88	0.07	1866
Montana.									
Fort Shaw	LewisaClarke	1.98	20	1.85	−0.13	7.19	1876	0.36	1872
New Hampshire.									
Hanover	Grafton	3.16	44	5.40	+2.24	7.37	1850	0.55	1852
New Jersey.									
Moorestown	Burlington	3.91	26	2.77	−1.14	7.38	1867	0.65	1880
South Orange	Essex	3.04	19	4.62	+1.58	6.46	1888	0.41	1880
New York.									
Cooperstown	Otsego	3.31	36	8.84	+5.53	8.84	1890	0.36	1879
Palermo	Oswego	2.62	36	4.75	+2.13	6.90	1867	0.30	1870
North Carolina.									
Lenoir	Caldwell	4.75	18	4.70	−0.05	11.50	1873	1.60	†
Ohio.									
N. Lewisburgh	Champaign	3.75	18	4.70	+0.95	7.95	1882	1.55	1879
Wauseon	Fulton	4.18	18	4.78	+0.60	8.22	1889	1.14	1877
Oregon.									
Albany	Linn	2.80	13	0.39	−2.41	5.70	1879	0.39	1884
Eola	Polk	1.99	20	0.26	−1.73	5.94	1879	0.26	1890
Pennsylvania.									
Dyberry	Wayne	2.92	20	5.56	+2.64	5.56	1890	0.36	1875
Grampian Hills	Clearfield	4.21	18	6.77	+2.56	11.60	1889	1.58	1866
Wellsborough	Tioga	5.13	11	7.85	+2.72	9.36	1884	1.51	1886
South Carolina.									
Statesburgh	Sumter	3.60	9	6.13	+2.53	6.68	1888	1.24	1882
Tennessee.									
Austin	Wilson	3.33	22	5.97	+2.64	8.40	1882	1.44	1877
Milan	Gibson	3.29	7	3.99	+0.70	4.98	1884	1.90	1888
Texas.									
New Ulm	Austin	2.66	17	4.07	+1.41	12.25	1884	0.05	1886
Vermont.									
Strafford	Orange	3.00	17	7.60	+4.60	7.60	1890	0.40	1877
Virginia.									
Birdsnest	Northampton	3.64	21	7.05	+3.41	7.85	1885	0.50	1879
Wisconsin.									
Madison	Dane	3.63	22	5.03	+1.40	8.39	1858	1.09	1870
Washington.									
Fort Townsend	Jefferson	2.00	16	0.94	−1.06	7.81	1875	0.61	1888

*1857, 1873, and 1885; †1881 and 1883.

EXCESSIVE PRECIPITATION.

Monthly precipitation to equal or exceed ten inches was reported at ten stations in Florida; at three stations in Louisiana and Maine; at two stations in Pennsylvania and Georgia; and at one station in Alabama, Indiana, South Carolina, and Texas; the heaviest monthly precipitation, 16.19, being reported at Hypoluxo, Fla.

In May of preceding years monthly precipitation to equal or exceed ten inches has been reported for sixteen years in Texas; for fourteen years in Kansas; for ten years in Iowa; for from five to nine years, inclusive, in Maine, New York, Pennsylvania, Virginia, North Carolina, Georgia, Florida, Mississippi, Louisiana, Arkansas, Illinois, Indiana, Missouri, and Nebraska; and for from one to four years, inclusive, in New Hampshire, Connecticut, Rhode Island, New Jersey, Delaware, South Carolina, Alabama, Tennessee, Maryland, District of Columbia, Indian Territory, Minnesota, Wisconsin, Kentucky, Michigan, the Dakotas, Colorado, Montana, California, and Washington. In states and territories other than those named, precipitation to equal or exceed ten inches has not been reported for May of preceding years. The following are more notable monthly rainfalls reported for May of preceding years: 34.85, at Melissa, Tex., in 1881, and 21.95 in 1873; 19.85, at Northport, Mich., in 1884; 19.40, at Hudson, N. Y., in 1876.

Precipitation to equal or exceed 2.50 inches in twenty-four hours was reported at thirteen stations in Georgia, and on five dates, the 15th, 25th, 26th, 27th, and 29th; at eleven stations in Florida, and on ten dates, the 4th to 7th, 15th, 16th, and 27th to 30th; at ten stations in Pennsylvania, and on eight dates, the 10th, 18th, 19th, 20th, 22d, 23d, 25th, and 26th; at nine stations in South Carolina, and on three dates, the 25th, 26th, and 27th; at eight stations in Louisiana, and on four dates, the 2d, 3d, 13th, and 24th; at eight stations in Texas, and on seven dates, the 1st 2d, 4th, 11th, 13th, 24th, and 25th; at seven stations in Iowa, and on four dates, the 9th, 10th, 22d, and 31st; at five stations in Illinois, and on three dates, the 9th, 10th, and 22d; at five stations in Kansas, and on two

dates, the 30th and 31st; at five stations in Michigan, and on two dates, the 9th and 10th; at four stations in Missouri, and on three dates, the 23d, 24th, and 30th; at three stations in Alabama, and on four dates, the 5th, 11th, 26th, and 27th; at three stations in Indiana, and on three dates, the 4th, 10th, and 12th; at three stations in Mississippi, and on two dates, the 2d and 3d; at three stations in North Carolina, and on two dates, the 26th and 27th; at three stations in Ohio, and on two dates, the 9th and 10th; at three stations in Virginia, and on three dates, the 24th, 26th, and 27th; at two stations in Wisconsin, and on two dates, the 9th and 10th; and at one station in Arkansas, on the 16th. Among the heavier rainfalls reported for this period were: 5.28, at Fort Deposit, Ala., 26–27th; 6.89, at Hypoluxo, Fla., 29–30th; 6.08, at Live Oak, Fla., 4–5th; 5.20, at Luling, La., 24th; 5.00, at Columbia, La., 13th; 5.07, at Lumberton, N. C., 26–27th; 6.02, at Simpsonville, S. C., 25–26th; 5.05, at Caddo Peak, Tex., 1st.

In May of preceding years precipitation to equal or exceed 2.50 inches in twenty-four hours has been reported for ten or more years in the lower Missouri and upper Mississippi valleys, in Texas, Louisiana, and along the south Atlantic coast; in Florida, the east Gulf states, the Dakotas, Colorado, Tennessee, Michigan, Maryland, and Pennsylvania for from five to nine years; and in Maine, Massachusetts, New York, Connecticut, Rhode Island, New Jersey, Delaware, Virginia, Kentucky, Ohio, Indiana, Minnesota, Wisconsin, and Montana for from one to four years. Over the plateau region and along the Pacific coast, except in California in 1889, rainfall to equal or exceed 2.50 inches in twenty-four hours has not been reported for May of preceding years. Among the heavier rainfalls reported for this period in May of preceding years are: 5.25, at Frederick, Md., 31st, 1889; 6.00, at West Almond, N. Y., 31st, 1889; over five inches at a number of stations in Pennsylvania May 31st, 1889, the greatest amount being 6.71 at Charlesville; 9.92, at Columbus, Ga., 22d, 1880; 9.28, at Durham, Ark., 1st, 1876; 7.60, at Austin, Tex., 30th, 1870; 7.50, at Okolona, Miss., 4th, 1887; 7.37, at Shreveport, La., 6th, 1876; and 9.00, at New Frankford, Mo., 28–29th, 1889.

Precipitation to equal or exceed one inch in one hour was reported at six stations in Texas, and on five dates, the 1st, 5th, 6th, 24th, and 25th; at five stations in Pennsylvania, and on three dates, the 13th, 19th, and 25th; at four stations in Louisiana, and on four dates, the 2d, 4th, 5th, and 25th; at three stations in Iowa, and on two dates, the 22d and 31st; at three stations in Mississippi, and on four dates, the 2d, 3d, 12th, and 19th; at three stations in Missouri, and on three dates, the 18th, 30th, and 31st; at two stations in Illinois, and on two dates, the 3d and 12th; at two stations in North Carolina, and on two dates, the 15th and 26th; at two stations in Tennessee, and on two dates, the 10th and 13th; at one station in Alabama on the 3d; at Jupiter, Fla., on the 6th, 28th, 29th, and 30th; at one station in Georgia on the 26th; at one station in Kansas on the 29th; at one station in Maryland on the 25th; at one station in Ohio on the 10th; at one station in South Carolina on the 13th; and in Virginia on the 24th. Among the heavier rainfalls reported for this period were: 1.60 in twenty-two minutes, at Savannah, Ga., on the 26th; 3.90 in one hour, at McCausland, Iowa, on the 22d; 1.00 in twenty minutes, at Offerle, Kans., on the 29th; 1.69 in twenty minutes and 1.75 in thirty-eight minutes, at Cumberland, Md., on the 25th; 1.60 in twenty-two minutes at Charlotte, N. C., on the 26th, and 3.00 in one hour, at Bolar, Va., on the 24th.

In May of preceding years precipitation to equal or exceed one inch in one hour has been reported for fourteen years in Kansas; for twelve years in Texas; for from five to ten years in Florida, North Carolina, South Carolina, Georgia, Missouri, Tennessee, Ohio, Nebraska, and Iowa; and for from one to four years in Massachusetts, Vermont, Connecticut, New York, Pennsylvania, Maryland, Virginia, Alabama, Mississippi, Arkansas, Louisiana, Indian Territory, Kentucky, Indiana, Illinois, Michigan, Wisconsin, the Dakotas, Colorado, Minnesota, Montana, and California. Among the heavier rainfalls reported for this period in May of preceding years are: 1.70 in twelve minutes, at Collinsville, Ill., 23d, 1888; 2.30 in fifteen minutes, at Embarrass, Wis., 28th, 1881; 0.50 in ten minutes, at Davenport, Iowa, 3d, 1888; 1.50 in twenty minutes, at Fort Riley, Kans., 14th, 1885; 1.50 in twenty minutes, at West Leavenworth, Kans., 13th, 1886; 1.50 in five minutes and 2.25 in forty minutes, at Fort McPherson, Nebr., 27th, 1868; 1.15 in ten minutes, at New York City, 22d, 1881; 1.10 in fifteen minutes, at Toledo, Ohio, 20th, 1880; 2.38 in thirty minutes, at College Hill, Ohio, 27th, 1888; 1.20 in ten minutes, at Mount Ida, Ark., 10th, 1882; 1.10 in fifteen minutes, at Dale Enterprise, Va., 12th, 1889; and 1.64 in twenty minutes, at Mobile, Ala., 5th, 1879.

Table of excessive precipitation, May, 1890.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Alabama.	*Inches.*	*Inches.*		*Inches*	*h. m.*	
Eufaula	.....	3.50	11	.....	.....	.....
Fort Deposit	.....	5.28	26–27	.....	.....	.....
Montgomery	10.19	3.54	5	1.15	0 55	3
Arkansas.						
Winslow	.....	2.51	16	.....	.....	.....
Florida.						
Alva	.....	3.01	28	.....	.....	.....
Archer	10.53	3.16	27	.....	.....	.....
Fort Meade	.....	2.50	7	.....	.....	.....
Hypoluxo	16.19	6.89	29–30	.....	.....	.....
Jacksonville	.....	3.71	28–29	.....	.....	.....
Jupiter	13.51	2.90	6	1.15	1 00	6
Do	.....	4.85	28–29	1.35	0 50	6
Do	.....	.....	.....	1.00	1 00	28
Do	.....	.....	.....	1.93	1 00	29
Do	.....	.....	.....	1.40	1 00	30
Lake City	.....	4.74	4	.....	.....	.....
Live Oak	11.99	6.08	4–5	.....	.....	.....
Do	.....	3.50	30	.....	.....	.....
Madison	12.72	.....	.....	.....	.....	.....
Merritt's Island	11.58	2.90	29	.....	.....	.....
Micco	10.19	.....	.....	.....	.....	.....
Saint Francis Barracks	10.71	.....	.....	.....	.....	.....
Tallahassee	12.36	4.20	4	.....	.....	.....
Titusville	15.14	3.84	15–16	.....	.....	.....
Do	.....	3.86	28–29	.....	.....	.....
Georgia.						
Athens (1)	.....	2.88	25–26	.....	.....	.....
Athens (2)	10.48	4.19	26	.....	.....	.....
Atlanta	.....	3.90	25–26	.....	.....	.....
Columbus	.....	3.27	26	.....	.....	.....
Eastman	10.54	2.52	15	.....	.....	.....
Forsyth	.....	2.82	26–27	.....	.....	.....
Fort McPherson	.....	3.84	25–26	.....	.....	.....
Louisville	.....	3.36	27	.....	.....	.....
Marietta	.....	3.15	25	.....	.....	.....
Quitman (2)	.....	2.55	29	.....	.....	.....
Savannah	.....	3.03	25–26	1.60	0 22	26
Way Cross	.....	3.09	29	.....	.....	.....
Waynesborough	.....	2.85	27	.....	.....	.....
Illinois.						
Belvidere	.....	3.10	9–10	.....	.....	.....
Cairo	.....	.....	.....	1.65	1 15	3
Chicago	.....	2.60	9–10	.....	.....	.....
Dwight	.....	3.05	22	.....	.....	.....
Rockford	.....	2.50	9	.....	.....	.....
Springfield	.....	.....	.....	1.08	1 00	12
Winnebago	.....	3.00	9–10	.....	.....	.....
Indiana.						
Crandall	10.62	2.60	4	.....	.....	.....
Do	.....	2.64	10	.....	.....	.....
Worthington	.....	2.63	12	.....	.....	.....
Iowa.						
Blakeville	.....	3.00	9	.....	.....	.....
Davenport	.....	.....	.....	1.50	0 50	22
Dubuque	.....	2.60	9–10	.....	.....	.....
Independence	.....	2.70	9	.....	.....	.....
Le Claire	.....	3.91	22	.....	.....	.....
Logan	.....	3.13	31	3.13	1 20	31
McCausland	.....	3.90	22	3.90	1 00	22
Webster City	.....	2.50	9	.....	.....	.....
Kansas.						
Globe	.....	4.20	30–31	.....	.....	.....
Lebo	.....	3.65	30–31	.....	.....	.....
Morse	.....	3.10	31	.....	.....	.....
Offerle	.....	.....	.....	1.00	0 20	29
Ottawa	.....	3.75	30–31	.....	.....	.....
Yates Centre	.....	3.03	30–31	.....	.....	.....
Louisiana.						
Baton Rouge	.....	.....	.....	2.10	2 00	25
Columbia	11.00	5.00	13	.....	.....	.....
Farmerville	.....	3.02	3	.....	.....	.....
Girard	.....	2.93	13	.....	.....	.....
Houma	.....	2.59	2	2.00	1 00	5
Lake Charles	.....	2.50	2	2.50	1 30	2
Luling	11.54	5.20	24	.....	.....	.....
Marksville	.....	.....	.....	1.25	0 45	4
Maurepas	.....	2.60	24	.....	.....	.....
Sugar Experiment Station	10.19	.....	.....	.....	.....	.....

Table of excessive precipitation—Continued.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Maine.	*Inches.*	*Inches.*		*Inches*	*h. m.*	
Bar Harbor	10.81					
Mayfield	10.29					
Orono	10.52					
Maryland.						
Cumberland (1)				1.69	0 20	25
Cumberland (2)				1.75	0 38	25
Fallston		3.00	25-26			
Michigan.						
Berrien Springs		2.86	9-10			
Cassopolis		3.44	9-10			
Jonesville		2.90	9-10			
Parkville		2.56	9-10			
Paw Paw		2.90	9-10			
Mississippi.						
Edwards		3.60	3			
Louisville				1.05	1 00	19
Meridian				1.18	1 00	12
Vicksburg		3.25	2-3	1.20	1 00	2
Do				1.00	1 00	3
Waynesborough		2.63	3			
Missouri.						
Adrian		2.91	30			
Appleton City		3.20	30			
Carthage		3.16	24			
Eldon		2.50	23			
Kansas City				1.24	1 08	30
Princeton				2.00	1 45	31
Saint Louis				2.23	0 50	18
North Carolina.						
Charlotte		3.03	26-27	1.60	0 22	26
Lumberton		5.07	26-27			
Wadesborough		2.55	26-27			
Wilmington				1.50	1 00	15
Ohio.						
Bellevue		2.81	9-10			
Orangeville		2.60	9-10	1.50	1 30	10
Tiffin		2.78	9-10			
Pennsylvania.						
Aqueduct	10.38	4.69	19			
Blooming Grove		2.60	19-20			
Catawissa		2.51	18-19			
Corry		2.77	22-23			
Franklin		3.02	10			
Gettysburgh		2.53	20			
Girardville	12.41					
Harrisburg		3.05	19-20	1.05	1 00	19
Hollidaysburgh				1.20	0 30	25
Lewistown				1.30	1 00	13
Mauch Chunk				1.07	0 45	19
Myerstown		2.66	25-26			
Pottsdam		2.60	26			
Wilkes Barre		3.21	19-20			
York				1.40	0 50	13
South Carolina.						
Blackville		3.40	27			
Evergreen		3.30	26			
Hardeeville				1.15	1 00	13
Kingstree		3.04	27			
Saint Matthews		3.29	27			
Simpsonville	11.61	6.02	25-26			
Spartanburgh (1)		4.50	27			
Spartanburgh (2)		3.00	25-26			
Statesburgh		3.56	26-27			
Trial		3.95	27			
Tennessee.						
Covington				1.20	0 30	10
Grief				1.00	1 00	13
Texas.						
Brady				1.04	0 55	1
Brazoria		3.05	24-25			
Brownsville				1.73	1 10	25
Caddo Peak	14.28	5.05	1			
Do		3.67	4			
Do		3.36	11			
Camp Peña Colorado				1.10	0 25	5
Columbia		3.95	25			
Corpus Christi				1.12	0 53	25
Dallas (2)		2.50	25			
Fort Brown				1.01	1 00	6
Galveston		2.87	24-25	1.46	1 00	5
Do				2.01	1 00	24
Longview		4.00	13			
Palestine		3.04	1			
Waco		2.70	2			
Virginia.						
Bolar		3.00	24	3.00	1 00	24
Fort Monroe		3.58	26-27			
Smithfield		3.65	26-27			
Wisconsin.						
Honey Creek		2.90	9			
Potosi		3.68	9-10			

Received too late for general discussion of weather, May, 1890.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Georgia.						
Diamond	11.60	3.00	19			

Received too late for publication in April Review.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Colony Surinam, S. A.						
Burnside-Coronie	11.44	4.15	9			
Do		3.29	18			
Colorado.						
Longmont		3.10	23			

MAXIMUM RAINFALLS IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfalls during May, 1890, for periods of five and ten minutes and one hour, as reported by regular stations of the Signal Service furnished with self-registering gauges:

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Bismarck, N. Dak*						
Boston, Mass	0.06	14	0.11	14	0.33	6
Buffalo, N. Y	0.18	3	0.25	3	0.40	3
Cincinnati, Ohio	0.22	13	0.30	13	0.40	13
Chicago, Ill †						
Cleveland, Ohio †						
Denver, Colo	0.05	22	0.05	22	0.20	22
Detroit, Mich	0.10	10	0.15	10	0.25	9, 25
Duluth, Minn	0.05	29	0.08	29	0.30	29
Galveston, Tex	0.43	5	0.83	5	2.01	24
Jupiter, Fla	0.35	4	0.65	10	1.93	29
Marquette, Mich*						
New York City	0.18	1	0.35	1	0.40	1
New Orleans, La	0.30	19	0.39	19	0.58	1
Norfolk, Va	0.20	6	0.28	6	0.55	27
Philadelphia, Pa	0.15	20	0.20	20	0.33	20
Savannah, Ga	0.35	3	0.40	3	0.60	3
San Francisco, Cal	0.03	10	0.05	10	0.15	10
Saint Louis, Mo	0.25	18	0.50	18	‡	
Saint Paul, Minn	0.03	23	0.07	23	0.25	23
Washington City	0.20	20	0.35	20	0.50	20

*Not sufficient for gauge to record. †Register out of order. ‡Record incomplete.

SNOW (snowfall in inches and tenths).

The greatest depth of snowfall was reported in west-central Colorado, where it exceeded ten inches. In extreme eastern upper Michigan more than eight inches fell; in south-central Minnesota and east-central Nevada five inches; over the northern part of upper Michigan, northwestern Minnesota, southeastern South Dakota, and north-central Wyoming more than four inches; generally over upper Michigan, northern Wisconsin, northern, western, and southern Minnesota, central Montana, northeastern Colorado, and central Nevada more than three inches. No snow was reported in the Atlantic coast states, save trace in northern New Hampshire, and at Kendall, western New York. In the Ohio and Mississippi valleys and on the eastern slope of the Rocky Mountains trace of snowfall was reported to the fortieth parallel; and in the plateau region to north-central New Mexico. No snow was reported in the Pacific coast states, save in Lassen county, California.

Snowfall was reported as follows: *California.*—Susanville, 1. *Colorado.*—Ranch, near Como, 10.8; Fort Collins, 8; Le Roy, 3.6; Wray and Yuma, 3; Box Elder, 2.5; Crook, Georgetown, and Watervale, 2; Abbott, 1.7; Cumbres, 1; Sunnyside, 0.5; Colorado Springs, trace. *Illinois.*—Lake Forest, trace. *Indiana.*—Angola, Farmland, and Point Isabel, trace. *Iowa.*—Amana, 1; Bancroft, Blakeville, Des Moines, Indianola, and Keokuk, trace. *Kansas.*—Allison, trace. *Michigan.*—Fort Brady, 8.6; Calumet, 6.5; Marquette, 5.6; Sault de Ste. Marie, 4.9; Atlantic, 4; Lathrop, 3.8; Crystal Falls, 3; Cheboygan, 1.7; Alpena, 0.7; Fort Mackinac, 0.5; Mottville, 0.1; Bear Lake, Gladwin, Grand Pass, Gulliver Lake, Harrison, and Ivan, trace. *Minnesota.*—Mankato, 5; Saint Vincent, 4.5; Le Seuer, 4; Duluth, 3.8; Montevideo, 3.6; Red Wing, 3.5; Moorhead, 3.4; Northfield and Sheldon, 3; Tracy, 3; Minneapolis, 2.5; Fort Ripley and Saint Paul, 2; Pine River Dam

and Rolling Green, 1; Morris, 0.8; Farmington, 0.4; Medford, trace. *Montana.*—Fort Maginnis, 3.4; Fort Custer, 0.1; Helena and Virginia City, trace. *Nebraska.*—Alliance and Hay Springs, trace. *Nevada.*—Ruby Hill, 5; Austin, 3.2; Palisade, 0.5. *New Hampshire.*—West Milan, trace. *New Mexico.*—Chama, trace. *New York.*—Kendall, trace. *North Dakota.*—Fort Pembina, 3.4; Fort A. Lincoln, 3; Fort Buford, 2.6; Fort Totten, 2.2; Davenport and Grand Forks, 1.5; Fort Yates, 1.2; Bismarck, 0.5. *Ohio.*—Wauseon, 1.1; Bangorville, Canton, and Weymouth, trace. *South Dakota.*—Clark and Fort Meade, 4; Brookings, 3.5; Rapid City, 2.5; Wolsey, trace. *Wisconsin.*—Phillips, 3.2; Embarrass, 2.5; Neillsville, 1; Lincoln, 0.2; Delavan, Greenwood, and Milwaukee, trace. *Wyoming.*—Fort McKinney, 4; Owen, 3; Cheyenne, 1; Fort Bridger and Fort Washakie, trace.

No reports of snow on the ground at the close of the month have been received.

HAIL.

Description of the more severe hail storms of the month are given under the heading "Local storms." Hail was re-reported as follows: 1st, Ky., Md., N. J., Pa., Tenn., Tex. 2d, Colo., Pa., S. Dak., Tenn. 3d, Ind. T., Ky., La., Mich., N. Y., S. Dak., Tex. 4th, Ga., Kans., La., Minn., N. Mex., Tex., Va., Wyo. 5th, Ark., Colo., Iowa, La., Mich., Nebr., N. Y., Ohio, Oregon, S. Dak., Tex. 6th, Cal., Iowa, Ky., Mich., Minn., Mo., Nebr., Nev., Ohio, S. Dak., Tenn. 7th, Ky., Mich., Nev., Ohio, Tenn., Va. 8th, Colo., Mo., Nebr., Va., Wyo. 9th, Colo., Iowa, Mo., Nebr., Nev., Tex., Wash., Wis. 10th, Cal., Ill., Ind., Mich., Nev., N. Mex., N. Y., Ohio, Tenn. 11th, Minn., Nebr., Tex., Wyo. 12th, Colo., Ill., Ind., Iowa, Minn., Miss., Mo., Nebr. 13th, N. Y., N. C., Pa., Tex., Va. 14th, Mass., N. J., Pa., S. C., Va. 15th, Mass., Nebr., S. C., Tex. 16th, Me., Mass., N. Mex., N. Y., Va., Wis. 17th, Kans., Nebr., N. H., N. Y., S. Dak. 18th, Colo., Fla., Ga., Ill., Ind., Iowa, Mo., Nebr., N. H., N. Y., S. Dak., Tex. 19th, N. C., Pa., S. C., Tenn., Tex., W. Va. 20th, Kans., S. Dak., Va. 21st, Nebr. 22d, Colo., Ill., Iowa, Kans., Mo., Nebr., N. Mex. 23d, Colo., Ill., Kans., La., Mo., Nebr., N. Mex., Ohio, Pa. 24th, Colo., Ill., Ind. T., Iowa, Mich., Minn., Ohio, Pa., S. Dak., Tex., Va. 25th, Ky., Md., Minn., N. Dak., Pa., S. Dak., Tex., Va., W. Va. 26th, Colo., Kans., Mich., Wis. 27th, Iowa, Minn., Nebr., Nev., N. Y., Utah. 28th, Colo., Conn., Mass., Minn., Nebr., Nev., N. H., R. I., Vt. 29th, Colo., Iowa, Nebr., N. Dak., Oregon, Wash., Wis. 30th, Ind., Iowa, Kans., Md., Mich., Mo., Nebr., Ohio, Oregon, Pa., Va., Wash., Wis. 31st, Ark., Cal., Mo., Mont., Oregon, Va., Wyo.

SLEET.

Sleet was reported as follows: 4th, Colo., Iowa, Minn. 5th, N. Y., S. Dak. 6th, Ill., Mich., S. Dak. 7th, Ohio, Tenn. 9th, S. Dak. 11th, Nev. 12th, Colo., S. Dak. 14th, Minn., Wis. 15th, S. Dak., Wis. 20th, Pa. 21st, S. Dak. 31st, Ohio.

WINDS.

The prevailing winds during May, 1890, are shown on chart ii by arrows flying with the wind. In New England, the south Atlantic states, the upper Mississippi valley, and on the south-eastern slope of the Rocky Mountains the winds were mostly from south to southwest; in Florida and the east and west Gulf states, from south to east; in the middle Atlantic states and the Ohio Valley and Tennessee, from southeast to southwest; in the Rio Grande Valley, from the southeast; in the lower lake region, from west to southwest; in the extreme northwest, from north to northwest; on the northeastern slope of the Rocky Mountains, over the northern plateau region, and along the middle Pacific coast, from northwest to southwest; on the middle-eastern slope of the Rocky Mountains from north to east; over the southern plateau region from south to west; over the middle plateau region from north to west; on the north Pacific coast, variable in Washington, and from west to northwest in Oregon; along the south Pacific coast from west to northwest; and in the upper lake region and the Missouri Valley, variable.

HIGH WINDS (in miles per hour).

Wind velocities of fifty miles, or more, per hour were reported at regular stations of the Signal Service as follows: 2d, 50, n., at Huron, S. Dak. 3d, 52, nw., at Fort McKinney, Wyo. 8th, 50, sw., at Dodge City, Kans. 10th, 59, ne., at Chicago, Ill. 12th, 52, n., at Fort Sully, S. Dak. 20th, 51, sw., at Dodge City, Kans. 24th, 55, sw., at Chicago, Ill.; 51, n., at San Antonio, Tex. 25th, 60, nw., at Bismarck, N. Dak.; 54, nw., at Corpus Christi, Tex. 27th, 54, n., at Fort McKinney, Wyo. 28th, 54, s., at Yankton, S. Dak.; 54, nw., at Fort Buford, N. Dak.; 50, sw., at Dodge City, Kans. 29th, 60, ne., at Nantucket, Mass.

LOCAL STORMS.

On the 1st a tornado, accompanied by rain and hail, passed southeastward over the northeastern part of McCulloch county, Texas, its path being about one hundred and fifty yards wide and several miles in length; the storm passed through an uninhabited part of the country, save where it struck and demolished a settlement of five houses, and levelled everything in its track. On the 3d a heavy storm caused a great amount of damage in De Soto county, Louisiana; a storm moving from the northwest, and attended by thunder, heavy rain, and some hail, struck Mesquite, Tex., about noon; the storm was fearful in its intensity for about one-half hour, and a great many buildings were blown down or damaged; excessively heavy rain occurred in Alabama, Mississippi, and southern Illinois, and heavy rain on the south Atlantic coast. On the 4th a violent wind storm occurred in Hood and Parker counties, Texas, killing several persons, and heavy hail damaged crops in Freestone and Young counties, Texas. On the 5th hail of unusual size began falling at Roseburgh, Oregon, at 8.21 p. m., and continued to fall for nine minutes; the hail-stones were from three-eighths to one-half inch in diameter and of a conical shape, some being more spherical than others, and some quite flattened; the hail storm was confined to the vicinity of Roseburgh and to the country lying north, northeast, and southeast of that city, and damaged young corn; a hail storm, moving east, passed over Camp Peña Colorado, Tex., accompanied by high wind, and lasted twenty-five minutes; hail fell to a depth of six inches, and some of the hail-stones measured one and one-half inch in circumference; a heavy wind and rain storm occurred at Natchez, and a violent wind storm at Jackson, Miss.; heavy electrical and rain storms prevailed in New York, New Jersey, Massachusetts, and Connecticut. On the 6th heavy electrical and rain storms occurred in Pennsylvania, Maryland, and West Virginia; and terrific electrical, rain, and wind storms were reported as having prevailed in Iowa for four days. On the 9th heavy storms were reported in Iowa, northern Missouri, and in Wilson county, Kansas. On the 10th a tornado occurred at York, Ohio, at about 4 p. m., causing considerable damage to buildings, etc.; a tornado visited Archer township, Harrison county, in the afternoon, uprooting trees, etc.

A tornado occurred at Akron, Summit Co., Ohio, on the 10th, concerning which Prof. Edward W. Claypole, of Buchtel College, Akron, Ohio, has made the following report: "A funnel-shaped cloud, moving toward northeast by east, or between that point and east-northeast, passed over Akron from 5.24 to 5.27 p. m. (local time), or 4.51 to 4.54 p. m. (central time), its track having an average width of about three hundred feet. The storm approached with thunder and lightning, but no flash was observed within a mile of where I stood. Heavy rain fell within

the range of the storm, about one hundred and fifty yards from the point of observation, and the rain was heavier during and after than before its passage; no hail fell. Quantities of timber and movable articles were carried up in the storm, and, although there is good testimony of a whirling motion, I was not close enough to clearly observe this motion. Timber on the north side of the track generally fell toward the southeast; in the track, toward northeast by east; and on the south side of the track, toward north-northeast; and, in rare cases, toward north by west. A far greater number of trees fell on the south side than on the north side of the centre of the storm's path, and their direction was often nearly due north. The storm appeared to divide toward the end of its path; one small part passing over or close by my house, and the other took the same course about one hundred and fifty yards farther on. A chimney on a house was blown down and a tree broken, while there was scarcely any wind where I stood, about one hundred and fifty feet farther on. A large piece of boarding, for bills, fully four hundred feet farther north from the line of the storm than my position, was thrown over and fell south. No persons were killed or seriously injured, and the damage to property approximated $15,000. This storm, or another one, came down about four miles to the northeast by east and destroyed a barn, but beyond this no further sign was seen in or near this county."

A storm passed through Tipton county, Tennessee, beginning at 2.45 p. m.; great damage was done by wind and hail; the rainfall, exclusive of the hail, was 1.20 inch in thirty minutes; the general direction of the storm was a little south of east, and the direction of the wind whirl was contrary to the movement of the hands of a watch; a severe wind storm prevailed at Memphis, Tenn., in the evening, and considerable damage was done to property and shade trees, and several boats sustained injury; a destructive storm visited Venago county, Pennsylvania, destroying buildings, killing or injuring several persons, and washing out railroad tracks; a hail storm, moving northeast, and accompanied by thunder and lightning, began at Stockton, Cal., at 5.45 p. m., and continued about seven minutes; the hail-stones were about the size of small peas; hail also fell at Nicolaus and Sutter Creek, but no damage was done. On the 12th a heavy wind storm visited Terre Haute, Ind., causing considerable damage to buildings and trees; a severe thunder-storm began at Saint Louis, Mo., at 7.45 p. m., and the wind attained a velocity of sixty miles per hour, without causing material damage; a heavy rain storm, attended by high wind, occurred at Meridian, Miss., causing damage to bridges, etc., and a severe hail storm was reported four miles west of that place. On the 13th a cloud-burst was reported at Mammoth Springs, Ark. On the 15th a heavy rain storm swept over Camp Peña Colorado, Tex., on a path almost parallel with that followed by the storm of the 5th; the storm continued fifty-five minutes; a heavy wind storm, moving northeast, commenced at Wahpeton, N. Dak., at 6 p. m., and continued about ten minutes, causing destruction to property in that section to the value of about $2,500. On the 17th a thunder-storm, attended by rain and some hail, began at Leavenworth, Kans., at 9.17 p. m., and hail caused damage to fruit about four miles east of that place.

On the 18th a thunder-storm of unusual severity passed southeastward over Saint Louis, Mo., and continued from 4 p. m. to 5.05 p. m.; large hail and heavy rain fell, the hail-stones covering the ground to a depth of one-half inch, and the precipitation for the sixty-five minutes was 2.28 inches, 2.23 inches of which fell in fifty minutes, and portions of the city were flooded to a depth of three feet; a destructive hail storm occurred at Fairbury, Nebr., destroying fruit, etc., within an area about one-half mile wide and three miles long; a severe storm passed over Wayne county, Ohio, between 3 p. m. and 4 p. m.; much damage was caused to buildings and trees by the wind, and many sheep were killed by hail; severe gales prevailed on Lakes Erie, Huron, and Michigan; crops were damaged near Dupont, Ga., by heavy hail. On the 20th houses were unroofed in Baltimore, Md., by wind, and in Frederick county, Maryland, hail injured fruit trees and crops; a severe rain storm occurred at Angelica, N. Y., during which a railroad bridge over the Genesee River was carried away, and other damage done by washouts. On the 22d a heavy thunder and rain storm occurred at Davenport, Iowa; a number of bridges over small streams were washed away, and railroads were damaged; heavy thunder-storms occurred at Logansport, Peru, and Marion, Ind., in the early morning; considerable damage was done near Peru by a cloud-burst, and houses were struck by lightning at Marion. On the 23d western Pennsylvania was visited by heavy rain, wind, and electrical storms, which caused considerable damage by flood, etc.; the northern counties of Kentucky and some of the more western counties of West Virginia were swept by heavy storms. On the 24th a tornado moving northeast passed southeast of Alma, Mich., at about 4 p. m., passing through the towns of Emerson and Wheeler, unroofing buildings and uprooting trees in a path about one-half mile wide; the storm was accompanied by thunder and lightning, and hail fell on its outer edges. On the 25th a heavy rain storm, accompanied by severe thunder and lightning, flooded streets and cellars and caused great damage at Johnstown, Pa.; heavy rain and electrical storms prevailed over Washington, Carroll, and Frederick counties, Maryland, at night. On the 29th a thunder-storm, accompanied by hail and heavy rain, began in the evening at La Crosse, Wis.; at about 3 a. m., 30th, hail-stones the size of walnuts fell, causing considerable damage to window glass; the storm was very destructive in Trempealeau county, and in the eastern part of Buffalo county, Wisconsin, where the rainfall was very heavy, carrying away dams and flooding streams. On the 30th a thunder-storm, with rain and hail, occurred at Blue Knob, Pa., commencing at 3.30 p. m.; hail the size of marbles fell to a depth of nearly one inch. On the 31st, at 12.40 p. m., a thunder-storm commenced at Parkersburgh, W. Va., moving from northeast of station towards the south; some of the hail-stones were one inch in diameter.

INLAND NAVIGATION.

FLOODS.

There was a general and marked fall in the lower Mississippi river and tributaries during the month, and much land in the river parishes of Louisiana which was inundated at the beginning of the month was being cultivated at its close. On the 1st the Mississippi River was 41.1 feet on the gauge at Helena, Ark., and 4.1 feet above the danger-line; 48.5 feet, and 7.5 foot above the danger-line at Vicksburg, Miss.; and 14.7 feet, and 1.7 foot above the danger-line at New Orleans, La. The Red River was 31.6 feet, and 2.6 feet above the danger-line at Shreveport, La., and the Arkansas River was 16.6 feet, and 0.6 foot above the danger-line at Fort Smith, Ark., and 23.7 feet, and 0.7 foot above the danger-line at Little Rock, Ark. The Red River rose at Shreveport, La., until the 8th, when it stood at 34.6 feet on the gauge, and 5.6 feet above the danger-line. The country below Fulton, Ark., was flooded, and immense damage was caused to property and stock. The Pandora levee, about eight miles above Shreveport, La., broke at 9 p. m. of the 6th, and on the 7th the plantations across the river from Shreveport were flooded by backwater. After the 8th the Red River fell steadily at Shreveport, La., until the close of the month. The lower Mississippi river fell steadily throughout the month, save at Memphis, Tenn., where there was a slight rise until the 4th, and there was a marked rise in

the Arkansas River at Fort Smith, Ark., on the 20th and 21st, and a rise of about one and one-half foot at Little Rock, Ark., from the 23d to 25th. On the 2d the Arkansas River fell below the danger-line at Fort Smith and Little Rock, Ark. On the 6th the water was rising between the Mississippi River and Bayou Teche. On the 15th the Red River fell below the danger-line at Shreveport, La., and on the 15th and 16th there was a slight rise in the Mississippi River at New Orleans, La. On the 31st the Mississippi River at Vicksburg, Miss., was 41.4 feet, and 0.4 foot above the danger-line, and at New Orleans, La., the stage of the water was 13.8 feet, and 0.8 foot above the danger-line. Most of the country from Bayou Sara to the mouth of the Red River, Pointe Coupee parish, Louisiana, was under water, and from the mouth of the Red River to within twelve miles of Monroe, Ouachita parish, La., a distance of over two hundred miles, the country had been inundated for nearly three months, and from the Red River up the Black River, for a distance of eighty miles, much of the land was under water at the close of month.

Disastrous floods, resulting from heavy rain, were reported in Ontario, Canada, on the 5th. On the 6th the Brazos River, Texas, was overflowing its banks and rising. On the 15th heavy rain caused the inundation of bottom lands in the vicinity of Camp Peña Colorado, Tex. Reports of the 20th state that rivers and streams in central New York and northeastern Pennsylvania overflowed their banks, flooding streets in towns and villages, submerging the tracks and causing washouts on railroads, and delaying farming operations. The Willamette River, Oregon, rose steadily from the 10th, and on the 16th, 17th, and 18th the water attained a stage of twenty feet on the gauge at Portland, flooding the lower docks. On the 26th high water was reported in the upper Potomac river and its tributaries, and in many places the streams overflowed their banks. A cablegram to the "New York Herald," dated the 29th, stated that railroad communication had been interrupted and villages inundated in Cuba by excessive rains. Reports of the 31st stated that the lowlands along Kings River, Fresno Co., Cal., were flooded, and that bridges were carried away, stock drowned, and crops destroyed. In Tulare county, California, Tulare Lake extended five miles over the surrounding country, causing much damage. In Scott county, Iowa, the heavy rains of the month caused floods which carried away bridges, devastated farms, and washed out highways. The report of the Nevada state weather service states that streams in that state overflowed as the result of melting of snow in the mountains. The Carson River was out of its banks the last fifteen days of the month, causing considerable damage.

STAGE OF WATER IN RIVERS AND HARBORS.

The following table shows the danger-points at the several stations; the highest and lowest water during May, 1890, with the dates of occurrence and the monthly ranges:

Heights of rivers above low-water mark, May, 1890 (in feet and tenths).

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
Red River:						
Shreveport, La	29.9	8	34.6	31	23.8	10.8
Arkansas River:						
Fort Smith, Ark	22.0	1	16.6	28	5.3	11.3
Little Rock, Ark	23.0	1	23.7	30	9.3	14.4
Missouri River:						
Ft. Buford, N. Dak.	.....	31	8.5	1	1.3	7.2
Sioux City, Iowa	.....	27	9.7	17	6.4	3.3
Omaha, Nebr	18.0	29	9.0	20, 21	6.5	2.5
Kansas City, Mo	21.0	28	10.0	15, 16	6.4	3.6
Mississippi River:						
Saint Paul, Minn	14.5	31	3.6	17, 18, 19	2.7	0.9
La Crosse, Wis	24.0	1	7.0	17	4.2	2.8
Dubuque, Iowa	16.0	1	10.0	22	4.9	5.1
Davenport, Iowa	15.0	1	8.0	22	3.7	4.3
Keokuk, Iowa	14.0	1	8.3	30, 31	4.0	4.3
Saint Louis, Mo	32.0	1	18.3	23	11.8	6.5
Cairo, Ill	40.0	1	36.7	11, 12	28.5	8.2
Memphis, Tenn*	34.0	4	29.3	21	22.8	6.5
Vicksburg, Miss	41.0	1	48.5	31	41.4	7.1
New Orleans, La	13.0	1	14.7	27	13.7	1.0
Ohio River:						
Pittsburgh, Pa	22.0	24	22.0	4	6.3	15.7
Parkersburg, W. Va.	38.0	26	29.5	5	11.0	18.5
Cincinnati, Ohio	50.0	30	41.3	6	24.2	17.1
Louisville, Ky	25.0	25	16.4	1, 2, 6	10.2	6.2
Cumberland River:						
Nashville, Tenn	40.0	25	28.2	6	14.0	14.2
Tennessee River:						
Chattanooga, Tenn	33.0	22, 23	11.9	15	6.6	5.3
Monongahela River:						
Pittsburgh, Pa	29.0	24	22.0	4	6.3	15.7
Savannah River:						
Augusta, Ga	32.0	28	20.3	13, 14, 25, 26	7.0	13.3
Willamette River:						
Portland, Oregon	15.0	20, 21	20.1	1	10.9	9.2

*On April 1st the zero of the gauge at Memphis, Tenn., was lowered one foot, and all stages of water reported for previous dates should have one foot deducted, for purposes of comparison.

ATMOSPHERIC ELECTRICITY.

AURORAS.

Auroras were reported as follows: 7th, South Canisteo, N. Y. 11th, Carson and Wesley, Iowa. 20th, Ardenia and Number Four, N. Y. 31st, Greenwood, W. Va.

THUNDER-STORMS.

The more severe thunder-storms of the month are described under "Local storms." East of the Rocky Mountains thunder-storms were reported in the greatest number of states and territories, thirty, on the 4th; in twenty-eight on the 14th; in twenty-five on the 1st, 5th, 18th, 24th, and 25th; in from twenty to twenty-four, inclusive, on the 3d, 10th, 11th, 12th, 13th, 14th, 17th, 19th, 20th, 23d, 30th, and 31st; and in from ten to nineteen, inclusive, on the 2d, 6th to 9th, 15th, 16th, 21st, 22d, 26th to 30th. There were no states east of the Rocky Mountains in which thunder-storms were not reported, and there were no dates on which thunder-storms were reported in less than ten states.

East of the Rocky Mountains thunder-storms were reported on the greatest number of dates, thirty, in Texas; on twenty-six in Florida and New York; on from twenty to twenty-five, inclusive, in Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, Nebraska, North Carolina, Ohio, Pennsylvania, and Virginia; on from ten to twenty, inclusive, in Alabama, Arkansas, Georgia, Indian Territory, Kentucky, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, New Jersey, South Carolina, South Dakota, Tennessee, West Virginia, and Wisconsin; on from one to nine, inclusive, in Connecticut, District of Columbia, Maine, Montana, New Hampshire, North Dakota, Rhode Island, and Vermont. West of the Rocky Mountains thunder-storms were reported as follows: Arizona, 28th; California, 4th, 6th, 10th, 24th, 26th, 27th, 28th, and 31st; Colorado, 2d, 3d, 8th, 9th, 10th, 12th, 13th, 16th, 20th, 22d, 23d, 27th to 30th; Idaho, 1st, 7th, 8th, 10th, and 31st; Nevada, 1st, 3d to 7th, 9th, 16th, 26th, 27th, 28th, and 30th; New Mexico, 1st to 5th, 9th to 13th, 21st, 23d, 24th, 29th, and 30th; Oregon, 5th, 6th, 7th, 9th, 10th, 25th, and 30th; Utah, 1st, 8th, and 30th; Washington, 7th, 8th, 19th, and 30th; Wyoming, 3d and 8th. There were no states or territories west of the Rocky Mountains in which thunder-storms were not reported.

On the 4th, when thunder-storms were most prevalent east of the Rocky Mountains, a low pressure storm moved from the middle Mississippi valley to western Pennsylvania; a low pressure area extended from New York to Texas, and thunder-storms were reported on the eastern slope of the Rocky Mountains and in all districts lying east of the Mississippi River. On the 14th, when thunder-storms occurred from the Rocky Mountains eastward, south of the Lake region, to the Atlantic coast, three low pressure storms appeared, one over the Saint Lawrence Valley, one over the Lake region, and one in the extreme northwest.

MISCELLANEOUS PHENOMENA.

HALOS.

Solar and lunar halos were reported in New England and the middle Atlantic states on twenty-seven dates; 93 per cent. of the halos were attended on the first day, 89 per cent. were followed on the second day, and 85 per cent. were followed on the third day by rain or snow. In the south Atlantic states halos were reported on fifteen dates; 87 per cent. of the halos were attended on the first day, 80 per cent. were followed on the second day, and 73 per cent. were followed on the third day by rain. In the Gulf States halos were reported on thirteen dates; 62 per cent. of the halos were attended on the first day, 77 per cent. were followed on the second day, and 62 per cent. were followed on the third day by rain. In the Mississippi and Ohio valleys halos were reported on twenty-five dates; 100 per cent. of the halos were attended on the first day, 92 per cent. were followed on the second day, and 84 per cent. were followed on the third day by rain. In the Lake region halos were reported on twenty-two dates; 95 per cent. of the halos were attended on the first day, 100 per cent. were followed on the second day, and 95 per cent. were followed on the third day by rain. In the Missouri Valley halos were reported on fifteen dates; 60 per cent. of the halos were attended on the first day, 73 per cent. were followed on the second day, and 93 per cent. were followed on the third day by rain or snow. In the Rocky Mountain and plateau regions halos were reported on ten dates; 90 per cent. of the halos were attended on the first day, 70 per cent. were followed on the second day, and 40 per cent. were followed on the third day by rain or snow. On the Pacific coast halos were reported on fifteen dates; 32 per cent. of the halos were attended on the first day, 13 per cent. were followed on the second day, and 27 per cent. were followed on the third day by rain or snow. In New England and the middle Atlantic states 52 per cent. of the halos occurred in advance of, and 48 per cent. following, low pressure storms. In the south Atlantic states 53 per cent. of the halos occurred in advance of, and 47 per cent. following, low pressure storms. In the Gulf States 56 per cent. of the halos occurred in advance of, and 44 per cent. following, low pressure storms. In the Mississippi and Ohio valleys 72 per cent. of the halos occurred in advance of, and 28 per cent. following, low pressure storms. In the Lake region 73 per cent. of the halos occurred in advance of, and 27 per cent. following, low pressure storms. In the Missouri Valley 47 per cent. of the halos occurred in advance of, and 53 per cent. following, low pressure storms. In the Rocky Mountain and plateau regions 30 per cent. of the halos occurred in advance of, and 70 per cent. following, low pressure storms. On the Pacific coast 13 per cent. of the halos occurred in advance of, and 87 per cent. following, or without the influence of, low pressure storms.

DROUGHT.

A report from Gove City, Kans., stated that wheat and rye in that section were almost ruined by dry weather. Advices from Eola, Oregon, stated that crops in that region were suffering for want of rain. Press dispatches from western and northwestern Kansas stated that the drought in those regions was broken by heavy rain the night of the 29th.

METEORS.

Meteors were observed as follows: 1st, Carson, Iowa. 2d, Alta, Ames, Algona, Bancroft, Britt, Des Moines, Fayette, Grinnell, Humboldt, Logan, Sioux City, Storm Lake, West Bend, and Wesley, Iowa; Princeton, Mo.; and Madison, N. J. 6th, Oregon, Mo. 7th, Cockrell, Ill.; Manhattan, Kans. 8th, Kirk, Colo. 9th, Fort Custer, Mont. 11th, Austin, Nashville, and Nunnelly, Tenn. 15th, Lansing, Mich.; and Madison, Wis. 17th, Vevay, Ind.; Harrodsburgh, Ky.; Lansing, Mich.; and Rugby, Tenn. 18th, Blakeville, Iowa. 19th, Beverly, N. J. 21st, Rugby, Tenn. 22d, Egg Harbor City, N. J.; Portsmouth, Ohio; Webster and Wolsey, S. Dak. 23d, Rugby, Tenn. 24th, Marquette, Mich. 25th, Beaver, Utah. 26th, Wolsey, S. Dak. 27th, Vevay, Ind.; Westerville, Ohio. 28th, Englewood, Kans. 29th, Rugby, Tenn. 30th, Thon, Colo.; Mesquite, Tex. 31st, Heppner, Oregon.

The following is an extract from the report of the Iowa weather and crop service relative to an aerolite observed in that state on the 2d: "On the 2d, at about 5.15 p. m., a large meteor was observed passing in a northeasterly direction over Sioux, O'Brien, Clay, Palo Alto, Kossuth, and Winnebago counties. The atmosphere was nearly cloudless and the meteor was sufficiently large and brilliant to be distinctly visible to observers at Des Moines, Atlantic, and other places in the southern half of the state; also from points in South Dakota and Minnesota. Before the meteor reached the earth an explosion occurred, causing a heavy report, and fragments of the meteor were found scattered over several square miles in the southwestern part of Winnebago county. The largest portion discovered, weighing about seventy pounds, was found in the north half of section 3, township 98, range 25, about eleven miles northwest of Forest City. At Britt, Hancock Co., the meteor was first seen at a point about 40° west of north, moving about northeast. There were five or six explosions, and the meteor left a trail of smoke, in puffs, following the line of its descent. At Forest City the direction of the meteor was from southwest to northeast, and it descended at an angle of about 28°. Reports from many points in the counties named agree in the main as to the direction, elevation, and great strength of the report of the meteor."

MIRAGE.

A very fine mirage was observed at Saint Vincent, Minn., on the 29th, at 5.10 a. m. The country for about thirty miles south of that place was plainly brought into view. Ground which is hid by intervening high ground was plainly visible in an elevated condition, and at the horizon the intervening space between the ground level and the mirage had the appearance of a trestle work or line of railroad. Mirage were also reported at Harrisburg, Pa., on the 11th, and at Woonsocket, S. Dak., on the 1st 7th, and 23d.

SUN SPOTS.

Haverford College Observatory, Pa. (observed by Prof. F. P. Leavenworth):

Date.	Number of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		Faculæ.	Remarks.
	Groups.	Spots.	Groups.	Spots.	Groups.	Spots.	Groups.	Spots.	Groups.	
May, 1890.										
1, 12 m	0	0	0	0	0	0	1	2	2	Definition good.
2, 11 a. m...	0	0	0	0	0	0	0	0	0	Definition poor.
3, 10 a. m...	0	0	0	0	0	0	0	0	2	Definition fair.
5, 10 a. m...	0	0	0	0	0	0	0	0	1	Definition fair.
7, 12 m	1	3	0	0	0	0	1	3	1	Definition fair; spots small.
8, 2 p. m...	0	5	0	0	0	0	1	5	1	Definition good; spots small.
9, 10 a. m...	0	14	0	0	0	0	1	22	2	Definition fine; spots small.
12, 9 a. m...	1	1	0	0	0	0	2	11	1	Definition fair; spots small.
13, 12 m	0	0	1	1	0	0	1	10	1	Definition fair; spots small.
14, 9 a. m...	0	0	0	0	0	0	1	14	2	Definition good; spots small.
15, 4 p. m...	0	0	0	0	0	0	0	0	0	Definition fair; spots small.
17, 10 a. m...	3	9	0	0	0	0	3	9	3	Definition fair; spots large.
18, 10 a. m...	0	0	0	0	0	0	2	9	3	Definition poor.
19, 10 a. m...	0	0	0	0	0	0	3	6	2	Definition fair.
20, 4 p. m...	1	1	1	2	0	0	3	4	1	Definition fair.
21, 9 a. m...	0	0	0	0	0	0	2	3	1	Definition poor.
22, 3 p. m...	0	0	0	0	0	0	1	2	2	Definition poor; spots small.
23, 4 p. m...	0	0	0	0	0	0	1	3	1	Definition fair.
24, 4 p. m...	0	0	0	0	0	0	0	0	2	Definition fair.
27, 4 p. m...	1	3	0	0	0	0	1	3	3	Definition good; spots small.
28, 9 a. m...	0	0	0	0	0	0	0	0	1	Definition fair.
29, 10 a. m...	0	0	0	0	0	0	0	0	0	Definition fair.
31, 10 a. m...	0	0	0	0	0	0	0	0	1	Definition poor.

Mr. C. E. Buzzell, Leaf River, Ill.: solar observations were

made during the month as follows: 3d to 9th, cloudy. 10th, two small spots first observed two days in on east limb; this group was breaking up on the 11th. 12th and 13th, cloudy. 14th, clear disc. 18th, one spot in south latitude just past meridian, also one spot in north latitude one day in on east limb; both in view on the 20th. 21st to 24th, cloudy. 25th, clear disc. 26th, one small spot one day past meridian, which had disappeared on the 27th. 28th to 31st, clear disc.

Mr. M. A Veeder, Lyons, N. Y.: May 5th, faculæ, that appeared by rotation April 22d, was at the western limb. 7th, faculæ and small spots appeared by rotation; the spots underwent many changes and faded out during the transit; the faculæ in their location was seen at the western limb on the 21st. 11th, small spots, not previously seen, were near the western limb. 16th, two spots appeared by rotation but had faded out on 21st and were not seen again. 18th, small spots and some faculæ were at the eastern limb. 26th, a spot, probably in the location of this disturbance, was seen, and on the 31st the faculæ in its vicinity was at the western limb. On the 18th a group of faculæ not previously seen was at the western limb. During the month solar disturbances were quite numerous but very evanescent.

Mr. John W. James, Riley, Ill.: observations were taken on the 1st, 2d, 6th, 7th, 8th, 10th, 11th, 14th, 16th, 17th, 18th, 20th, 21st, 23d, 25th to 31st, inclusive, but the only spots seen were one group, two days from eastern edge of disc, on the 10th, which was gone on the 14th, and a spot two days from western edge, 18th, which had disappeared, 21st.

Mr. H. D. Gowey, North Lewisburgh, Ohio: sun spots were observed on the 8th, 10th, 11th, and 12th.

PRAIRIE AND FOREST FIRES.

Prairie fires were reported near Fort Buford, N. Dak., on the 1st, 2d, 3d, 7th, and 8th, and a large field fire was reported near Los Angeles, Cal., on the 19th.

Forest fires were reported on the 5th at New Richmond, Wis., and near Stillwater and Red Lake Falls, Minn.

VERIFICATIONS.

FORECASTS FOR 24 HOURS IN ADVANCE.

[Verifications made by Assistant Professor C. F. Marvin, assisted by Mr. H. E. Williams, chief clerk of the Forecast Division.]

The forecasts for districts east of the Rocky Mountains for May, 1890, were made by 2d Lieutenant W. A. Glassford, Signal Corps, and those for the Pacific coast districts were made at San Francisco, Cal., by 2d Lieutenant J. E. Maxfield, Signal Corps.

Percentages of forecasts verified, May, 1890.

States.		States.	
Maine	71.2	Kentucky	79.8
New Hampshire	77.2	Ohio	85.7
Vermont	76.5	West Virginia	81.9
Massachusetts	81.9	Indiana	87.0
Rhode Island	78.1	Illinois	86.9
Connecticut	77.7	Lower Michigan	77.7
Eastern New York	74.5	Upper Michigan	75.9
Western New York	88.2	Wisconsin	75.7
Eastern Pennsylvania	77.5	Minnesota	71.0
Western Pennsylvania	86.7	Iowa	81.4
New Jersey	77.2	Kansas	79.4
Delaware	83.5	Nebraska	81.2
Maryland	83.0	Missouri	86.3
District of Columbia	85.2	Colorado	76.3
Virginia	84.5	North Dakota	68.8
North Carolina	82.0	South Dakota	78.6
South Carolina	83.9	Southern California*	85.3
Georgia	84.0	Northern California*	78.9
Eastern Florida	87.9	Oregon*	82.6
Western Florida	85.7	Washington*	80.9
Alabama	80.2	*By elements:* Weather	82.6
Mississippi	78.3	Temperature†	77.7
Louisiana	80.3	Monthly percentage of weather and temperature combined‡	80.6
Texas	86.1		
Arkansas	78.8		
Tennessee	82.8		

*In determining the monthly percentage of weather and temperature combined, the Pacific coast states are not included. †The forecasts of temperature in districts east of the Rocky Mountains for May, 1890, were made with reference to the maximum temperature alone; that is, a prediction of warmer or cooler indicated that the maximum temperature of the day designated would be higher or lower than the maximum of the previous day. ‡The monthly percentage of weather and temperature combined is determined by multiplying the percentage of weather by 6, and the percentage of temperature by 4, and dividing their sum by 10.

FORECASTS FOR 48 HOURS IN ADVANCE.

Appreciating the great importance that long time predictions possess for the general public the Chief Signal Officer has authorized forecasts for forty-eight and seventy-two hours, covering the second and third days in advance. Such forecasts are optional with the predicting officer, and are only made when clearly in the public interest, and cover, in all cases, considerable areas of country, and are not confined to localities.

Percentages of verifications of forecasts made for second day in advance. Number of predictions made: weather, 125; temperature, 51. Percentages of verifications: weather, 77.8; temperature, 70.2. Weather and temperature combined, 75.9.

No forecasts for seventy-two hours were made during the month.

CAUTIONARY SIGNALS FOR MAY, 1890.

Statement showing percentages of justifications of wind signals for the month of May, 1890:

Wind signals.—(Ordered by Lieutenant W. A. Glassford.) Total number of signals ordered, one hundred and fifty-four; justified as to velocity, wholly, eighty, partly, thirteen; justified as to direction, one hundred and twenty-nine. Of the signals ordered, one hundred and twenty-six were cautionary signals, of which sixty-six were wholly, and five partly justified, and twenty-eight were storm signals, of which fourteen were wholly, and eight partly justified. Forty signals were ordered for easterly winds, of which thirty-two were justified, and one hundred and fourteen were ordered for westerly winds, of which ninety-seven were justified. Percentage of justifications, 60.0.

No cold-wave signals were ordered during the month.

Percentages of verifications of weather and temperature signals reported by directors of the various State Weather Services for May, 1890.

States.	Weather.	Temperature.	States.	Weather.	Temperature.
Illinois	82.0	81.5	Missouri	78.0	86.0
Indiana	80.0	88.0	New Jersey	77.5	89.9
Kansas	75.5	84.3	New York	84.0	88.2
Kentucky	90.0	93.0	North and South Dakota	80.0	80.0
Michigan	81.2	84.1	Pennsylvania	83.0	89.0
Minnesota	63.0	70.0	South Carolina	86.9	90.0

STATE WEATHER SERVICES.

[*Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.*]

The following extracts and summaries are republished from reports for May, 1890, of the directors of the various state weather services:

ALABAMA.

Temperature.—Highest monthly mean, 72.7, at Mobile; lowest monthly mean, 64.9, at Guntersville and Chepultepec; maximum, 92, at Gadsden, 31st; minimum, 34, at Double Springs, 8th; greatest local monthly range, 57, at Double Springs; least local monthly range, 34, at Mobile.

Precipitation.—Greatest monthly 10.19, at Montgomery; least monthly, 1.32, at Guntersville.—*Prof. P. H. Mell, Auburn, director; J. M. Quarles, Private, Signal Corps, assistant.*

ARKANSAS.

Temperature.—Highest monthly mean, 75.2, at Monticello; lowest monthly mean, 62.8, at Heber; maximum, 100, at Washington, 30th; minimum, 40, at Brinkley, 10th; greatest local monthly range, 54, at Lead Hill; least local monthly range, 32, at Dallas.

Precipitation.—Greatest monthly, 9.65, at Ozone; least monthly, 3.68, at Lonoke.—*M. F. Locke, Commissioner of Agriculture, Little Rock, director; W. U. Simons, Sergeant, Signal Corps, assistant.*

COLORADO.

Temperature.—The mean was about 0.5 below the normal of the last four years; highest monthly mean, 66.6, at Fruita; lowest monthly mean, 33.8, at Leadville; maximum, 93, at Fruita, 27th, and at Julesburgh, 27th and 28th; minimum, 11, at Breckenridge, 13th; greatest local monthly range, 78, at Sunnyside; least local monthly range, 39, at Cumbres.

Precipitation.—The average deficiency was more than 80 per cent. below the normal of the last four years.

Wind.—Prevailing directions, north and west.—*Prof. F. H. Loud, Colorado Springs, director; W. S. Miller, Sergeant, Signal Corps, assistant.*

ILLINOIS.

Temperature.—Highest monthly mean, 65.6, at Golconda; lowest monthly mean, 52.8, at Riley; maximum, 96, at McLeansborough, 23d; minimum, 28, at Hennepin, 12th; greatest local monthly range, 64, at McLeansborough; least local monthly range, 43, at Golconda.

Precipitation—Greatest monthly, 6.02, at Olney; least monthly, 2.56, at Beason.

Wind.—Prevailing direction, southwest.—*John Craig, Sergeant, Signal Corps, Springfield. in charge.*

INDIANA.

Temperature.—The mean was 2.2 below the normal; highest monthly mean, 68.5, at Huntingburgh; lowest monthly mean, 52.1, at Valparaiso; maximum, 93, at Huntingburgh, 30th, and Rockville, 31st; minimum, 29, at Point Isabel, 2d, 8th, and 11th; greatest local monthly range, 59, at Angola; least local monthly range, 43, at De Gonia Springs.

Precipitation.—The average was about 0.50 above the normal; greatest monthly, 8.34, at Point Isabel; least monthly, 2.26, at Columbus.

Wind.—Prevailing direction, southwest.—*Prof. H. A. Huston, La Fayette, director; C. F. R. Wappenhans, Sergeant, Signal Corps, assistant.*

IOWA WEATHER AND CROP SERVICE.

Temperature.—The mean was 3.1 below the normal; highest monthly mean, 62.1, at Clarinda; lowest monthly mean, 52.2, at Cresco; maximum, 96, at Blakeville, 30th; minimum, 26, at Cresco, 7th; greatest local monthly range, 64, at Blakeville; least local monthly range, 49, at McCausland.

Precipitation.—The average was 0.80 below the normal; greatest monthly, 6.44, at McCausland; least monthly, 1.61, at Indianola.

Wind.—Prevailing direction, northwest.—*J. R. Sage, Des Moines, director; G. M. Chappel, Sergeant, Signal Corps, assistant.*

KANSAS.

Temperature.—Highest monthly mean, 69.9, at Monument; lowest monthly mean, 58.8, at Ellis; maximum, 110, at Gove City, 20th; minimum, 25, at Alton, 7th; greatest local monthly range, 77, at Eureka Ranch; least local monthly range, 43, at Buffalo Park; greatest daily range, 61, at Shields, 20th; least daily range, 7, at Concordia, 4th, and at State Agricultural College, 30th.

Precipitation.—Greatest monthly, 6.84, at Lebo; least monthly, trace, at Lisbon.

Wind.—Prevailing direction, south.—*Prof. J. T. Lovewell, Topeka, director; T. B. Jennings, Sergeant, Signal Corps, assistant.*

KENTUCKY.

Temperature.—The average was 2.5 below the normal; maximum, 93, at Richmond, 29th; minimum, 32, at Harrodsburgh, 8th; greatest local monthly range, 59, at Harrodsburgh; least local monthly range, 38, at Millersburgh.

Precipitation.—The average for the month was about the normal; greatest monthly, 5.70, at Harrodsburgh; least monthly, 2.70, at Owenton.

Wind.—Prevailing direction, southwest.—*Dr. E. A. Grant, Louisville, director; S. P. Gresham, Private, Signal Corps, assistant.*

LOUISIANA.

Temperature.—The mean temperature was 1.5 below the normal; highest monthly mean, 75.2, at Hammond; lowest monthly mean, 69.8, at Cameron; maximum, 98, at Lake Charles, 29th; minimum, 40, at Port Gibson, Miss., 8th; greatest local monthly range, 55, at Cameron; least local monthly range, 16, at Port Eads.

Precipitation.—The average was 0.33 above the normal; greatest monthly, 11.54, at Luling; least monthly, 1.95, at Shreveport.

Wind.—Prevailing direction, south.—*R. E. Kerkam, Sergeant, Signal Corps, New Orleans, in charge.*

MICHIGAN.

The features of the month were the low night temperatures of the first twenty days, and the excess in rainfall in the central portion of the state.

Temperature.—The mean was 5.4 below the the normal of the last fifteen years; highest monthly mean, 57.2, at Bangor; lowest monthly mean, 38.7, at Atlantic; maximum, 92, at Benton Harbor, 30th; minimum, 20, at Crystal Falls, Chase, and Evart, 1st; greatest local monthly range, 67, at Ionia; least local monthly range, 39, at Atlantic; greatest daily range, 44, at Mio, 2d; least daily range, 1, at Manistee, 3d.

Precipitation.—The average was 1.20 above the normal of the last fifteen years; greatest monthly, 6.90, at Chelsea; least monthly, 2.31, at Evans.

Wind.—Prevailing direction, southwest.—*N. B. Conger, Sergeant, Signal Corps, Lansing, director.*

MINNESOTA.

Temperature.—Highest monthly mean, 54.7, at Mankato; lowest monthly mean, 43.2, at Duluth; maximum, 90, at Red Wing, 30th; minimum, 14, at Moorhead, 1st; greatest local monthly range, 72, at Crookston; least local monthly range, 47, at Duluth; greatest daily range, 44, at Saint Vincent, 21st; least daily range, 2, at Duluth, 18th,

Precipitation.—Greatest monthly, 5.65, at Rolling Green; least monthly, 1.15, at Ortonville.

Wind.—Prevailing direction, northwest.—*John Healy, Corporal, Signal Corps, Saint Paul, in charge.*

MISSISSIPPI.

Temperature.—The mean was 1.4 below the normal; highest monthly mean, 74.8, at Pearlington; lowest monthly mean, 64.8, at Hernando; maximum, 98, at Columbus, 12th; minimum, 38, at Aberdeen, 8th; greatest local monthly range, 55, at Vaiden; least local monthly range, 26, at Pearlington. Light frost was reported in the eastern part of the state on the 8th.

Precipitation.—The average was 0.74 above the normal; greatest monthly, 7.76, at Holly Springs; least monthly, 0.47, at Hazlehurst.

Wind.—Prevailing direction, south.—*R. B. Fulton, Signal Corps, University, director.*

MISSOURI.

Temperature.—Highest monthly mean, 67.0, at Protem; lowest monthly mean, 56.0, at Kirksville; maximum, 96, at Protem; minimum, 32, at Fayette and Miami.

Precipitation.—Greatest monthly, 5.81, at Saint Louis; least monthly, 1.15, at Craig.—*Prof. Francis E. Nipher, Saint Louis, director.*

METEOROLOGICAL REPORT OF THE MISSOURI STATE BOARD OF AGRICULTURE.

Temperature.—Highest monthly mean, 68.4, at Willow Springs; lowest monthly mean, 60.1, at Keokuk, Iowa; maximum, 97, at Willow Springs, 30th; minimum, 32, at Platt River and Princeton, 5th, and at Fayette, 6th; greatest local monthly range, 63, at Willow Springs; least local monthly range, 32, at Windsor.

Precipitation.—Greatest monthly, 8.09, at Cassville; least monthly, 1.15, at Craig.

Wind.—Prevailing direction, south.—*Levi Chubbuck, Secretary of State Board of Agriculture, Columbia, director; A. L. McRae, Sergeant, Signal Corps, assistant.*

NEBRASKA.

The mean temperature for the month was nearly the normal, but the rainfall was deficient, especially in the western and southwestern parts of the state.

Temperature.—Highest monthly mean, 65.0, at Ashland; lowest monthly mean, 50.6, at Fort Niobrara; maximum, 100, at Long Pine; minimum, 14, at Fort Niobrara.

Precipitation.—Greatest monthly, 6.75, at West Point; least monthly, 0.56, at Culbertson.

Wind.—Prevailing direction, northwest.—*Prof. Goodwin D. Swezey, Crete, director; G. A. Loveland, Sergeant, Signal Corps, assistant.*

NEVADA.

Temperature.—The mean was 0.6 above the normal; maximum, 105, at El Dorado Canyon, 25th; minimum, 23, at Austin, 11th; greatest local monthly range, 62, at Elko; least local monthly range, 42, at Beowawe; greatest daily range, 40, at Columbus Marsh; least daily range, 10, at Elko.

Precipitation.—The average was 0.09 below the normal; greatest monthly, 2.41, at Susanville, Cal.; least monthly, 0.00, at Yount's Ranch.

Wind.—Prevailing direction, south.—*Prof. Chas. W. Friend, Carson City, director; H. E. Wilkinson, Corporal, Signal Corps, assistant.*

NEW ENGLAND METEOROLOGICAL SOCIETY.

The weather for New England was slightly below the normal in temperature and sunshine, and above in precipitation.

Temperature.—Highest monthly mean, 59.9, at Springfield and Westborough; lowest monthly mean, 47.8, at West Jonesport; maximum, 86, at Westborough, 14th; minimum, 22, at Berlin Falls, 12th, and at West Milan, 3d; greatest local monthly range, 55, at Plymouth; least local monthly range, 24, at Block Island; greatest daily range, 55, at Plymouth, 3d; least daily range, 1, at Waterbury, 20th.

Precipitation.—Greatest monthly, 10.81, at Bar Harbor; least monthly, 2.48, at Nantucket.

Wind.—Prevailing direction, south.—*Prof. William H. Niles, Boston, Mass., president; Prof. Winslow Upton, Providence, R. I., secretary; J. Warren Smith, Private, Signal Corps, assistant.*

NEW JERSEY.

Temperature.—The mean was 1.0 above the normal; highest monthly mean, 66, at Trenton; lowest monthly mean, 57, at Atlantic City; maximum, 87, at Beverly and Oceanic, 19th and 29th, respectively; minimum, 33, at New Brunswick and Newton, 9th; greatest local monthly range, 52, at New Brunswick; least local monthly range, 30, at Ocean City; greatest daily range, 42, at Freehold, 5th; least daily range, 2, at Newark, 6th.

Precipitation.—The average was 0.50 below the normal; greatest monthly, 7.17, at Newton; least monthly, 2.60, at Rancocas.

Wind.—Prevailing direction, southwest.—*E. W. McGann, Sergeant, Signal Corps, New Brunswick, in charge.*

NEW YORK.

Temperature.—The temperature was below the normal, except in the lower Hudson valley and on Long Island; maximum, 85, at Geneva, 3d, and at Massena, 25th; minimum, 21, at Potsdam, 2d; greatest local monthly range, 61, at Massena; least local monthly range, 36, at Setauket.

Precipitation.—The precipitation was above the average, except at Fort Hamilton, Fort Columbus, and White Plains, where deficiencies were reported.

Wind.—Prevailing direction, southwest.—*Prof. E. A. Fuertes, Ithaca, director; I. W. Brewer, Private, Signal Corps, assistant.*

NORTH CAROLINA.

Temperature.—Highest monthly mean, 72.4, at Cheraw and Florence; lowest monthly mean, 57.3, at Highlands; maximum, 96, at Chapel Hill, 24th; minimum, 26, at Highlands, 8th; greatest local monthly range, 60, at Douglas; least local monthly range, 27, at Hatteras.

Precipitation.—Greatest monthly, 8.00, at Lumberton; least monthly, 1.85, at Clear Creek.

Wind.—Prevailing direction, southwest.—*Dr. Herbert B. Battle, Raleigh, director; C. F. von Herrmann, Sergeant, Signal Corps, assistant.*

NORTH AND SOUTH DAKOTA.

Temperature.—The mean was about 2.5 below the normal; highest monthly mean, 56.2, at Canton, S. Dak.; lowest monthly mean, 45.6, at Gallatin, N. Dak.; maximum, 96, at Alexandria, Wolsey, and Woonsocket, S. Dak., 29th; minimum, 15, at Aberdeen, S. Dak., 9th, at Rapid City, S. Dak., 12th, and at New England City, N. Dak., 15th; greatest local monthly range, 75, at Rapid City, S. Dak.; least local monthly range, 55, at Spearfish, S. Dak.

Precipitation.—The monthly average was 0.92 below the normal; greatest monthly, 4.85, at Flandreau, S. Dak.; least monthly, 0.57, at Bismarck, N. Dak.

Wind.—Prevailing direction, northwest.—*S. W. Glenn, Sergeant, Signal Corps, Huron, S. Dak., in charge.*

OHIO.

Temperature.—The means of the northern section, the middle section, the southern section, and of the state were 1.9, 1.3, 0.9, and 1.4, respectively, below the average for the sections and state; maximum, 92, at North Lewisburgh and Pomeroy, 30th; minimum, 28, at Newcomerstown, 2d; greatest daily range, 44, at Pomeroy, 17th; least daily range, 4, at Sandusky, 4th.

Precipitation.—The averages for the northern section, the middle section, the southern section, and the state, were 2.38, 0.88, 0.51, and 1.25, respectively, above the normal for the sections and state; greatest monthly, 8.70, at Carrollton; least monthly, 3.39, at Georgetown.—*Prof. B. F. Thomas, Columbus, director; Lieut. Charles E. Kilbourne, secretary; C. M. Strong, Corporal, Signal Corps, assistant.*

OREGON.

Temperature.—Maximum, 98, at Grant's Pass, 23d; minimum, 24, at North Powder and Burns, 26th, 27th, and 30th; highest monthly mean, 63.4, at Hood River; lowest monthly mean, 52.9, at Joseph.

Precipitation.—The average was about 1.00 below the normal; greatest monthly, 3.24, at La Grande; least monthly, 0.19, at Hood River.

Wind.—Prevailing direction, northwest.—*Hon. H. E. Hayes, Master State Grange, Oswego, director; B. S. Pague, Sergeant, Signal Corps, assistant.*

PENNSYLVANIA.

Temperature.—The mean was 1.0 below the normal; highest monthly mean, 63.9, at Annville; lowest monthly mean, 52.5, at Eagle's Mere; maximum, 89, at Wilkes Barre, 31st; minimum, 23, at Nisbet, 1st; greatest local monthly range, 31.7, at Selin's Grove; least local monthly range, 15, at Eagle's Mere; greatest daily range, 48, at Lewiston, 13th; least daily range, 1, at Le Roy, 30th.

Precipitation.—The average was 3.50 above the normal; greatest monthly, 12.41, at Girardville; least monthly, 2.96, at Philadelphia.

Wind.—Prevailing direction, west.—*Under direction of the Franklin Institute, Philadelphia; T. F. Townsend, Sergeant, Signal Corps, assistant.*

SOUTH CAROLINA.

Temperature.—Highest monthly mean, 74.0, at Trial; lowest monthly mean, 66.2, at Evergreen; maximum, 95, at Chester, 29th; minimum, 30, at Spartanburgh, 8th; greatest local monthly range, 62, at Spartanburgh; least local monthly range, 32, at Camden and Port Royal.

Precipitation.—Greatest monthly, 9.08, at Evergreen; least monthly, 2.66, at Port Royal.

Wind.—Prevailing direction, southwest.—*Hon. A. P. Butler, Columbia, director; G. E. Hunt, Corporal, Signal Corps, assistant.*

TENNESSEE.

The month was characterized by an abnormal rainfall during the first half, and a period of low temperature during the first week, culminating in light frost throughout the state.

Temperature.—The mean was nearly the normal for the last eight years; highest monthly mean, 71.5, at Woodstock; lowest monthly mean, 62.3, at Grief and Lawrenceburgh; maximum, 92, at Waynesborough, 12th, at Cog Hill, 29th, and at Fayetteville and Dyersburgh, 31st; minimum, 32, at Lawrenceburgh and Waynesborough, 8th; the daily ranges of temperature were very nearly the normal.

Precipitation.—The average was the greatest during the last eight years; greatest monthly, 7.23, at Jacksboro; least monthly, 2.30, at Cog Hill.

Wind.—Prevailing direction, south.—*J. D. Plunket, M. D., Nashville, director; H. C. Bate, Signal Corps, assistant.*

TEXAS.

Temperature.—The mean was about normal over the eastern portion of the state and along the coast, where the greatest departure noted was a deficiency of 1°; over the Panhandle and western portion of the state an excess of from 2 to 3 was noted; highest monthly mean, 81, at Rio Grande City; lowest monthly mean, 63.8, at Mountain Spring; maximum, 100, at Rio Grande City, 31st; minimum, 36, at Fort Elliott, 16th; greatest monthly range, 54, at Fort Elliott; least monthly range, 22, at Galveston.

Precipitation.—The average was decidedly in excess of the normal in all parts of the state, except in the extreme western portion, where a slight deficiency occurred, and in some localities in eastern Texas, where the deficiency was very marked; greatest monthly, 7.90, at Waco; least monthly, trace, at El Paso.—*D. D. Bryan, Galveston, director; I. M. Cline, Sergeant, Signal Corps, assistant.*

Meteorological record of Army post surgeons, voluntary, and other co-operating observers, May, 1890.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean.	Precip'n.
Alabama.	°	°	°	*Ins.*
Bermuda *†	86	47	69.2	4.36
Citronelle	92	46	74.2	7.47
Columbiana †	88	38	69.1	5.06
Decatur (1) †	.....	.....	.....	5.67
Decatur (2) †	94	36	68.6	5.37
Double Springs *	91	34	68.1	7.39
Eufaula	88	46	72.6	8.93
Evergreen †	91	50	71.8	6.08
Fort Deposit e	91	44	72.2	6.09
Livingston (1)	87	45	70.3	4.15
Livingston (2)	88	42	68.0	7.59
Marion	88	37	68.6	3.30
Mt. Vernon B'ks	90	45	71.2	5.38
Opelika	93	42	71.2	5.55
Pine Apple †	95	43	71.6	5.07
Selma (2)	91	49	73.5	3.92
Tuscumbia (2)	90	38	67.8	3.87
Valley Head †	90	38	65.3	4.78
Alaska.				
Juneau	68	36	48.0	4.85
Arizona.		*		
Antelope Valley	.....	.....	.....	0.00
Ash Creek	.....	.....	.....	T.
Ash Springs	.....	64	73.6	.....
Bisbee	.....	.....	.....	0.00
Chiri Cahua M't's	.....	.....	.....	0.00
Cooley's Springs †	.....	.....	.....	0.04
Dragoon	.....	.....	.....	0.00
Dos Cabezos	.....	.....	.....	0.00
Eagle Pass	.....	53	66.3	0.00
Fairbank	.....	.....	.....	0.00
Florence	108	48	76.2	0.00
Fort Apache	94	36	62.7	0.00
Fort Bowie	92	52	71.2	0.00
Fort Huachuca	95	47	71.2	.....
Fort Grant	92	50	69.6	0.01
Fort Lowell	105	44	71.9	0.00
Fort McDowell	108	45	75.4	0.00
Fort Mojave	107	51	78.4	0.00
Fort Verde	100	41	68.9	0.00
Gila Bend *	102	54	84.0	0.00
Grand Central Mill	.....	.....	.....	0.00
Holbrook	92	33	62.4	0.00
Mount Huachuca d.	99	47	70.4	0.00
Natural Bridge	.....	.....	.....	0.01
New River	100	45	72.2	0.00
Phœnix (2)	100	48	73.4	0.00
San Carlos	.....	41	.....	0.00
Show Low	.....	.....	.....	0.00
Signal †	105	47	69.9	0.00
Teviston	.....	.....	.....	0.00
Tip Top †	.....	.....	.....	0.00
Tombstone	99	50	71.8	0.00
Tucson (1) †	105	50	76.0	0.00
Walnut Ranch	.....	.....	.....	0.00
Arkansas.				
Arkansas City †	.....	.....	.....	6.73
Brinkley	88	40 †	67.1	4.78
Camden †	87	48	69.7	4.77
Conway	89	52	69.5	6.50
Dallas	87	55	.....	9.10
Devall's Bluff	92	44	69.8	5.48
Forrest City †	88	48	70.4	6.26
Fulton †	.....	.....	.....	3.49
Harrisburgh	88	44	69.1	4.43
Heber	89	48	62.8	4.55
Helena (1) †	.....	.....	.....	5.80
Helena (2)	90	48	70.0	4.73
Hot Springs *	.....	43	.....	6.36
Lead Hill	96	42	67.0	4.08
Little Rock B'ks	90	45	69.8	6.39
Lonoke	89	50	72.7	3.68
Malvern	88	42	66.1	3.70
Monticello	92	48	75.2	.....
Newport (1) †	.....	.....	.....	4.20
Newport (2)	92	32	67.2	4.12
Osceola	89	43	68.1	6.24
Ozone	83	45	66.4	9.65
Pine Bluff	92	42	71.8	5.73
Prescott	90	50	70.8	8.18
Russellville	91	44	70.4	4.36

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Arkansas—Cont'd.	°	°	°	*Ins.*
Stuttgart	89	47	69.8	6.00
Texarkana	94	48	72.0	6.42
Washington	100	49	73.1	9.27
Winslow *†	80	42	64.8	6.57
British Columbia.				
New Westminster	76	43	56.9	3.04
California.				
Alcatraz Island	73	40	56.1	0.64
Angel Island	80	42	57.7	1.20
Arcata	.....	.....	.....	2.05
Arch Beach	78	58	60.0	.....
Barstow †	104	40	71.0	0.00
Benicia Barracks	100	45	62.5	0.88
Berkeley	82	45	57.5	1.44
Campo	66	46	.....	0.90
Centreville *	100	54	66.4	1.08
Colegrove	.....	.....	.....	0.08
Crescent City	.....	.....	.....	0.52
Evergreen	.....	.....	.....	1.50
Fort Bidwell	86	72	58.1	1.07
Fort Gaston	101	38	63.3	1.57
Fort Mason	79	46	57.9	1.02
Georgetown †	89	38	59.4	4.66
Grass Valley	.....	.....	.....	3.44
Hydesville †	86	39	56.7	1.58
Iowa Hill *	91	40	62.9	3.48
Jolon	88	50	65.7	0.30
Lewis Creek	100	51	71.4	0.55
Los Banos (1) *	99	54	70.2	0.33
Los Gatos (2)	.....	.....	.....	1.30
National City	79	55	61.2	0.41
Oakland (1) *	87	47	59.7	1.17
Pasadena	92	37	64.1	0.29
Placerville *	91	37	59.9	3.61
Presidio of S. F	80	43	56.8	1.44
Riverside	96	38	62.5	0.17
Sacramento (1)	88	42	62.0	2.10
Salinas (1) *	76	48	57.2	0.65
San Diego B'ks	76	49	62.5	0.24
Santa Barbara (1)	91	44	60.0	0.18
Santa Clara *	89	47	61.4	0.73
Sonoma d	94	44	61.2	1.12
Steeles	87	42	60.6	0.40
Stockton (1)	.....	.....	.....	0.55
Susanville * †	89	33	60.1	1.51
Vacaville (1) *	96	48	65.9	1.63
Walla Walla Ck	87	32	58.4	1.29
Walnut Creek	101	43	62.5	0.45
Wheatland	102	45	65.4	1.84
Canada.				
McGill Col. Observatory, Montreal.	74	28	51.6	4.85
Colorado.				
Abbott	.....	.....	.....	1.13
Alma	61	21	39.1	0.12
Apishapa	86	37	59.0	0.13
Box Elder	.....	.....	.....	0.73
Brandon	.....	.....	.....	0.33
Breckenridge	74	11	41.2	.....
Brush	.....	.....	.....	0.37
Cañon City	88	38	63.0	0.80
Castle Rock	86	31	54.8	1.51
Chromo	.....	.....	.....	0.23
Climax *	58	18	36.0	2.35
Crook	.....	.....	.....	0.77
Cumbres	62	23	43.6	T.
Delta †	89	32	59.7	0.45
Denver (Jes. Col.)	88	32	58.4	1.30
Durango (1)	.....	.....	.....	0.00
Eagle Farm	.....	.....	.....	1.73
Fort Collins	85	29	56.1	1.19
Fort Crawford	79	30	55.4	0.17
Fort Lewis	77	25	51.6	0.10
Fort Logan	88	32	57.8	1.95
Fort Morgan	.....	.....	.....	0.89
Fruita	93	30	66.6	0.09
Georgetown	72	28	49.4	1.12
Greeley	88	33	55.6	1.21
Gunnison	79	22	49.1	0.00
Hardin	.....	.....	.....	0.96
Husted	85	30	54.5	1.05

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Colorado—Cont'd.	°	°	°	*Ins.*
Idaho Springs	80	29	51.9	1.53
Julesburg	93	28	60.2	2.54
Kirk	.....	.....	.....	2.12
Laird	.....	.....	.....	1.41
Lamar	92	40	63.8	1.02
La Porte	.....	.....	.....	1.06
Las Animas	87	40	62.6	1.12
Lay	.....	.....	.....	0.25
Leadville	63	20	33.8	.....
Le Roy	93	30	59.7	1.03
Livermore	.....	.....	.....	0.62
Middle Box Elder	.....	.....	.....	1.33
Minnesapolis	.....	.....	.....	1.03
Monte Vista	85	27	54.8	0.18
Parachute	.....	.....	.....	0.25
Peyton	.....	.....	.....	1.15
Pinkhamton	.....	.....	.....	0.30
Ranch near Como	66	20	42.4	1.28
Red Cliff	.....	.....	.....	1.40
Rifle Falls	77	32	52.9	0.34
Rocky Ford	93	44	69.4	0.29
Sanborn	.....	.....	.....	2.20
San Luis Ex. Sta	81	29	52.8	0.02
Sedgwick	.....	.....	.....	0.68
Sheridan Lake	.....	.....	.....	1.12
Sunnyside o	90	12	49.1	0.07
T. S. Ranch	85	32	62.6	0.28
Thon	86	29	54.0	1.80
Upper Pine	.....	.....	.....	1.82
Vilas	.....	.....	.....	0.86
Villa Grove	.....	.....	.....	0.10
Watervale	.....	.....	.....	0.73
Westcliffe	74	25	47.3	0.27
Wray	.....	.....	.....	1.42
Yuma	.....	.....	.....	0.67
Connecticut.				
Canton	82	31	57.7	5.01
Clark's Falls	.....	.....	.....	5.09
Colchester	79	35	56.6	.....
Falls Village	.....	.....	.....	4.73
Fort Trumbull	81	37	57.7	5.17
Hartford (1)	80	37	55.9	6.53
Hartford (2)	.....	.....	.....	6.02
Lake Konomoc	.....	.....	.....	4.97
Lebanon	.....	.....	.....	4.71
Mansfield	77	34	54.9	6.33
Middletown	80	38	57.1	5.51
New Hartford (1)*	76	33	54.2	4.81
Newington	.....	.....	.....	6.14
North Woodstock	.....	.....	.....	6.30
Shelton	78	36	56.8	5.14
South Manchester	.....	.....	.....	6.47
Thompson	74	35	55.6	.....
Uncasville	.....	.....	.....	5.66
Voluntown*	78	34	55.8	4.65
Wallingford	.....	.....	.....	4.22
Waterbury	79	36	57.2	5.97
West Simsbury	.....	.....	.....	4.89
Delaware.				
Kirkwood*	.....	44	62.6	.....
District of Columbia.				
Washington B'ks	86	40	63.4	4.60
Florida.				
Alva†	95	55	75.8	8.17
Archer†	95	49	75.1	10.53
Fort Barrancas	87	50	73.1	4.89
Fort Meade*	89	58	72.8	9.60
Homeland	93	57	78.2	4.85
Hypoluxo	.....	68	75.5	16.19
Lake City†	92	41	72.8	9.94
Live Oak f	92	50	73.2	11.99
Madison*†	83	53	73.9	12.72
Manatee†	94	50	76.8	4.29
Matanzas*	87	63	73.7	7.37
Merritt's Island†	89	63	76.6	11.58
Pine Level	.....	63	75.5	8.09
St. Francis B'ks	.....	58	.....	10.71
San Antonio	93	60	72.8	3.38
Tallahassee	88	54	72.8	12.36
Villa City†*	90	64	75.6	7.08
Georgia.				
Albany	92	48	74.0	2.93
Allapaha	91	45	72.8	6.99
Andersonville	97	38	67.9	3.37
Athens (1)	87	43	69.3	9.27
Athens (2)†	96	38	72.2	10.48
Bainbridge	90	49	73.8	1.80
Camak	90	40	71.2	5.44
Cartersville	90	38	69.2	3.27
Columbus	86	48	70.6	8.23
Eastman	94	48	73.4	10.54
Forsyth*	88	50	71.9	7.31
Fort Gaines	93	44	72.8	6.61
Fort McPherson	93	32	68.5	5.87
Gainesville	88	36	67.6	0.65
Gillsville*	88	50	71.2	4.40
Griffin	90	42	71.4	7.25
Hephzibah*	86	50	71.6	3.15
Jesup†	92	42	73.5	4.19
Louisville	91	44	72.4	8.40
Macon	91	44	71.5	8.20
Marietta†	86	39	67.3	6.44
Milledgeville*†	87	43	70.2	4.48
Millen	94	44	74.0	5.97
Monticello†*	.....	54	70.0	6.95
Newnan	88	40	65.4	6.07
Point Peter*	.....	42	66.0	5.65
Perry	.....	54	72.6	5.56
Quitman (1)*	91	53	73.6	8.80
Quitman (2)	92	50	74.2	8.68
Smithville	90	44	71.4	7.07
Thomasville (1)	91	48	72.2	6.46
Thomasville (2)	91	48	72.6	5.66
Toccoa	90	38	67.3	6.43
Union Point	90	38	69.7	5.19
Washington	87	44	70.4	6.86
Way Cross	88	48	74.6	6.12
Waynesborough	92	44	70.8	7.99
West Point	88	50	73.0	5.16
Woolley's Ford*	86	42	65.6	.....
Idaho.				
American Falls	88	32	58.1	0.45
Beaver	.....	.....	.....	0.37
Boisé Barracks	91	35	60.2	1.94
Bonanza	74	17	45.3	1.06
Era†	75	28	53.3	0.95
Fort Sherman	85	38	57.8	0.88
Kootenai	86	45	56.9	0.67
Lewiston	93	39	64.0	1.20
Mullan	87	30	50.5	1.52
Payette	92	34	61.6	1.18
Soda Springs†	79	25	51.6	0.88
Illinois.				
Aurora (1)†	88	29	54.4	4.25
Aurora (2)*	91	34	55.2	5.84
Beardstown†	.....	.....	.....	2.80
Beason	89	30	57.4	2.56
Belvidere	88	35	54.5	5.08
Charleston	90	33	61.2	3.40
Cockrell	89	36	59.2	3.89
Collinsville	88	36	62.6	3.13
Dwight	89	31	58.5	5.08
East Peoria	94	38	61.9	2.99
Fort Sheridan	90	33	55.0	5.25
Golconda*	87	44	65.6	4.70
Grand Tower†	.....	.....	.....	2.35
Greenville	91	34	62.6	2.58
Griggsville*	88	38	61.0	3.31
Hennepin	87	28	54.6	4.54
Irishtown	.....	.....	.....	3.65
Jordan's Grove*	90	36	63.7	2.92
Lacon	89	38	59.0	3.95
Lake Forest	94	33	55.7	5.08
Lanark	86	31	57.7	3.71
Louisville	90	35	63.3	2.70
Martinsville	88	32	64.4	3.57
Mascoutah*	89	34	.....	2.80
Mattoon	88	.....	62.0	.....
McLeansborough	96	32	64.4	4.10
Mount Carmel†	.....	.....	.....	3.19
Olney	92	42	63.5	3.95
Oswego*	89	36	54.8	5.27
Ottawa†	90	32	59.0	3.99
Pana	91	44	63.6	3.57
Peoria (1)*†	.....	.....	.....	2.51
Peoria (2)	93	33	61.4	2.74
Philo	88	32	59.7	3.84
Pontiac	94	32	57.2	3.65
Riley	84	29	53.4	4.33
Rockford	88	31	55.1	5.28
Rock Island Ars'l	90	24	58.9	5.03
Rushville	94	32	60.6	3.42
South Evanston	90e	32e	57.2e	4.38
Sycamore*	87	35	54.4	3.87
Warsaw	.....	.....	.. ..	2.50
Watseka	91	32	57.7	5.37
White Hall*	90	36	64.6	3.02
Winnebago	92	34	56.6	4.35
Indiana.				
Angola	91	32	58.5	5.30
Butlerville*	84	44	60.0	4.45
Cannelton	89	34	62.0	5.07
Columbia City	86	32	59.7	5.17
Columbus	90	40	61.6	2.26
Connersville	85	41	60.5	3.90
Crandall	96	31	66.7	10.62
De Gonia Springs	83	40	63.7	5.59
Delphi	86	31	56.5	7.44
Evansville†	.....	.....	.....	4.30
Farmland	86	39	60.7	5.89
Franklin	88	40	61.8	3.33
Huntingburgh	93	47	68.5	5.80
Huntington†	.....	.....	.....	5.01
Jeffersonville	88	39	65.1	3.66
La Fayette	87	34	59.4	5.11
Logansport (1)	.....	.....	.....	8.32
Logansport (2)	87	31	57.7	6.17
Marengo	92	45	65.6	8.20
Marion	86	30	59.0	6.10
Mauzy	90	33	60.6	3.24
Mount Vernon (1)†	.....	.....	.....	3.12
Mount Vernon (2)	90	39	64.2	3.12
Muncie	96	41	63.8	5.79
New Providence	85	33	.....	4.06
Point Isabel*	86	29	58.0	8.34
Princeton	91	40	61.8	3.70
Rockville	93	35	62.9	3.89
Rushville†	.....	.....	.....	3.10
Seymour	87	40	63.5	3.21
Shelbyville	88	43	65.2	3.46

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Indiana—Cont'd.	°	°	°	*Ins.*
Sunman†	88	34	61.3	3.19
Valparaiso	80	31	51.8	4.89
Vevay	91	36	64.3	4.73
Vincennes†	.....	.....	.....	3.47
Worthington	84	35	57.2	4.53
Indian Territory.				
Caddo Creek	92	51	73.0	.....
Eufaula	.....	.....	.....	5.55
Fort Gibson	89	41	69.3	5.61
Fort Reno	89	35	67.1	2.87
Fort Sill	90	42	69.0	4.58
Fort Supply	90	32	66.2	2.21
Guthrie	90	46	72.2	1.38
Healdton	86	52	70.4	2.44
Tulsa†	.....	.....	.....	3.70
Iowa.				
Alta	88	33	57.5	3.20
Amana†	90	30	57.1	2.60
Ames	88	35	58.0	4.62
Atlantic	91	33	58.2	2.26
Bancroft	88	32	54.6	3.88
Belle Plaine*	90	32	55.9	4.34
Blakeville*	96	32	56.2	5.05
Carroll	86	28	56.7	3.26
Carson	86	35	59.3	2.40
Cedar Rapids†	89	30	57.5	3.06
Clarinda*	88	34	62.1	4.42
Clinton	92	26	57.6	4.43
Cresco	85	30	53.2	4.73
Des Moines	90	32	60.0	.....
Eagle Grove*	90	32	56.8	4.80
Fayette†	88	26	53.1	5.75
Fort Madison*	93	39	61.0	3.14
Glenwood (1)	94	32	61.9	3.28
Grinnell	88	35	60.7	3.26
Hampton	87	28	53.5	4.02
Humboldt*	88	29	58.4	3.72
Independence*	85	35	56.2	4.63
Indianola	88	30	58.9	1.60
Iowa City	81	31	53.8	2.20
Irwin	88	30	57.3	3.19
Larrabee	.....	.....	.....	3.52
Le Claire†	.....	.....	.....	6.36
Logan†	88	32	59.7	6.29
Manson*	88	30	57.4	3.05
Maquoketa*	88e	32e	53.4e	3.03
McCausland*	90	41	61.1	6.44
Monticello*	90	29	56.6	4.48
Mount Pleasant*†	85	38	58.4	3.20
Mount Vernon	87	34	58.7	3.65
Muscatine (1)	.....	.....	.....	2.81
Muscatine (2)	88	27	58.8	3.61
Osage	.....	32	52.2	4.39
Oskaloosa (1)*	92	36	60.0	1.85
Sac City	86	32	52.3	3.65
Storm Lake*	86	32	56.3	2.50
Vinton*	88	34	56.0	4.26
Washington*	94	33	60.8	2.22
Webster City*	86	32	55.2	4.25
Wesley†	86	27	54.0	2.65
West Bend*†	88	33	54.1	3.26
Kansas.				
Abilene	84	35	62.1	0.65
Allison*	92	40	63.0	1.50
Bucklin	.....	.....	.....	2.15
Buffalo Park	88	45	.....	.....
Burr Oak	94	30	63.6	1.00
Cawker City	96	45	67.2	1.05
Cold Water	.....	.....	.....	1.62
Collyer	96	40	68.8	0.40
Concordia	86	26	58.2	1.66
Conway	88	32	64.5	2.40
Cunningham*	91	32	64.0	2.58
Downs	.....	.....	.....	1.83
Elco	92	34	65.2	3.84
Elk Falls†	85	38	65.4	2.05
Ellis (1)	91	27	58.8	.....
Ellis (2)	96	46	69.8	.....
Emporia	87	35	63.1	4.22
Englewood*	88	44	66.9	2.96
Eureka Ranch	106	29	66.2	0.55
Ft. Leavenworth (1)	86	34	63.3	4.73
Ft. Leavenworth (2)	82	36	61.5	3.71
Fort Riley	98	32	63.0	1.24
Fremont	97	28	61.5	1.30
Gibson	98	26	62.9	0.72
Globe*	87	41	61.8	6.11
Gove City	103	36	64.4	0.36
Grainfield	86	42	67.7	2.50
Grenola	96	42	64.6	1.70
Grinnell	98	48	69.3	1.00
Halstead	86	32	64.1	2.13
Havensville	96	38	63.6	1.83
Horton	90	32	64.6	2.87
Independence	90	35	65.0	3.33
Junction City	.....	.....	.....	2.12
Kansas City	89	36	63.2	3.36
Kellogg	94	32	66.1	5.18
Kingman	.....	.....	.....	2.27
Kirwin†	.....	.....	.....	0.90
La Crosse	91	39	67.8	0.64
La Harpe*	.....	39	63.6	4.91
Lakin	89	30	61.0	0.50
Larned	.....	.....	.....	0.31
Lawrence	89	39	63.2	5.14
Lebo	91	33	64.3	6.84
Leoti	95	34	62.8	0.87
Lincoln	90	38	64.9	.....
Lisbon	100	44	66.5	T.
Luray	91	36	69.6	1.55
Macksville	87	30	61.9	1.12
Manhattan (1)†	.....	.....	.....	2.13
Manhattan (2)	92	30	62.9	1.81
Manhattan (3)*	92	34	61.5	2.18
Mankato	90	35	60.5	0.75
McAllaster	91	41	61.5	.....
Minnespolis	86	30	62.8	1.90
Monument	95	39	69.9	1.25
Morse*	85	33	61.8	4.31
Ness City	.....	.....	.....	0.90
Norton	98	41	.....	.....
Oakley	100	48	.....	.....
Oberlin†	.....	.....	.....	0.99
Offerle	93	44	63.2	3.38
Ogallah	91	45	.....	0.25
Oswego	89	34	66.3	5.06
Quenemo	92	33	61.8	3.22
Quinter	94	38	.....	.....
Rome	91	34	64.2	2.30
Salina†	86	42	65.4	2.15
Scott City	.....	.....	.....	1.07
Sedan*	91	40	66.9	3.74
Sharon Springs	88	44	62.8	0.50
Shields	95	32	64.0	1.03
Tribune†	92	34	61.0	0.85
Wakefield	.....	.....	.....	1.37
Wa Keeney	94	38	65.8	0.16
Wallace	.....	.....	.....	0.56
Wellington	95	35	65.2	2.97
Weskan	93	40	66.7	1.40
Winona	93	40	66.8	1.00
Yates Centre	.....	.....	.....	4.91
Kentucky.				
Bowling Green†	89	35	67.3	2.69
Burnside†	.....	.....	.....	7.12
Caddo	87	35	68.7	2.43
Catlettsburgh	.....	.....	.....	7.27
Canton*	90	40	67.0	3.64
Earlington	87	37	62.9	4.39
Eddyville†	.....	.....	.....	3.46
Falmouth (1)†	.....	.....	.....	3.26
Frankfort (2)	90	36	63.1	4.91
Franklin†*	88	43	65.1	4.30
Greensburgh†	.....	.....	.....	5.45
Harrodsburgh	91	32	63.0	5.70
Louisa†	.....	.....	.....	6.47
Millersburgh*†	83	45	63.5	4.16
Mount Sterling†	85	38	61.3	5.29
Newport Barracks	89	35	63.2	3.32
Owenton†	88	38	60.6	2.70
Paducah†	.....	.....	.....	4.42
Pellville†	91	37	64.4	4.13
Princeton	90	35	65.6	4.77
Richmond†	93	35	65.1	4.06
Shelbyville†	88	34	64.5	3.85
South Fork†*	85	40	62.5	?
Williamsburgh†	.....	.....	.....	8.15
Louisiana.				
Abbeville*	89	59	75.6	4.63
Alexandria†	91	50	71.6	3.73
Amité City†	91	53	73.0	4.62
Baton Rouge	90	58	72.7	6.39
Cameron†	95	39	76.4	4.60
Cheneyville	88	49	72.6	3.52
Clinton	95	51	72.8	2.37
Columbia	91	48	72.1	11.00
Convent	88	52	75.7	4.82
Coushatta (1)	.....	.....	.....	3.91
Coushatta (2)	94	45	72.6	4.80
Crowley	89	50	72.8	3.69
Delhi†	.....	.....	.....	3.79
Donaldsonville	88	51	71.7	6.62
Edgard	86	57	73.7	5.47
Emilie	89	59	74.4	5.45
Farmerville	89	50	71.8	6.77
Girard†	.....	.....	.....	6.82
Grand Cane	92	50	73.4	3.75
Grand Coteau	87	55	74.3	3.57
Hammond	89	53	75.2	5.48
Houma†	90	54	73.6	8.60
Jackson Barracks	88	56	73.8	5.98
Jeanerette	88	55	73.1	5.87
La Fayette†	91	52	72.8	3.32
Lake Charles	98	50	72.6	7.20
Liberty Hill	95	45	73.0	4.59
Luling	87	44	70.3	11.54
Mandeville	94	51	73.4	4.60
Marksville*†	90	52	74.4	3.70
Maurepas	87	55	73.0	6.68
Melville†	88	60	74.2	4.86
Minden	92	48	72.5	4.73
Monroe†	91	52	71.6	5.16
Natchitoches	90	49	72.6	6.34
New Iberia	87	56	72.9	5.45
Paincourtville	91	53	74.4	5.64
Plaquemine	94	54	74.2	4.62
Port Eads	81	65	73.6	6.93
Shell Beach	89	57	74.0	5.58
Sugar Ex. Station	88	56	73.8	10.19
Thibodeaux	.....	.....	.....	4.62

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Louisiana—Cont'd.	°	°	°	*Ins.*
Vidalia	92	44	72.5	3.59
Winnsborough	95	48	75.0	4.47
Maine.				
Bar Harbor	68	35	51.6	10.81
Belfast*	69	40	51.3	.....
Calais	70	31	52.0	8.63
Cornish	76	36	55.0	6.66
Fairfield	71	29	52.8	7.79
Farmington	.....	42	56.7	7.76
Fort Preble	73	31	52.4	6.70
Gardiner	74	32	52.4	7.84
Kennebec Arsenal	72	32	52.1	2.60
Kent's Hill	72	32	51.8	6.94
Lewiston	72	30	51.4	7.51
Mayfield	68	24	48.8	10.29
Orono †	73	33	52.1	10.52
Petit Menan *	60	38	49.7	.....
West Jonesport	66	38	47.8	.....
Maryland.				
Barren Creek Sp'gs†	82	40	62.9	3.43
Cumberland (1)	80	41	61.4	7.13
Cumberland (2)	82	40	62.3	7.51
Fallston	81	41	61.0	8.26
Fort McHenry	82	41	62.5	5.60
Frederick	84	41	62.1	7.01
Gaithersburgh *	.....	44	59.2	.....
Galena †*	.....	44	64.4	3.90
Jewell	.....	46	65.4	4.84
Leonardtown	.....	42	61.0	4.30
McDonogh	85	39	61.2	5.41
Mt. St. Mary's Col †	81	39	61.4	6.01
Woodstock	81	39	62.3	5.44
Massachusetts.				
Amherst Ex Sta (1)	79	32	56.4	5.14
Amherst Ex Sta (2)	80	32	57.0	5.39
Andover	81	34	57.2	5.07
Blue Hill (sum't)	77	36	53.9	5.77
Blue Hill (base)	79	38	56.6	5.62
Blue Hill (valley)	81	36	57.1	5.58
Boston	.....	.....	.....	5.42
Brewster	72	34	55.8	3.61
Cambridge (1)	77	36	56.6	5.06
Cambridge (2)	78	37	57.8	6.09
Chestnut Hill	82	34	57.2	5.80
Chicopee	.....	.....	.....	5.94
Clinton	.....	.....	.....	5.02
Cotuit	70	35	54.4	3.53
Deerfield*	84	39	58.6	.....
Dudley	79	36	57.7	5.60
Fall River (1)	72	42	53.6	5.80
Fall River (2)	76	38	55.4	6.30
Fiskdale	.....	.....	.....	5.64
Fitchburg (1) *	78	40	56.7	5.54
Fitchburg (2)	78	34	56.8	5.50
Fort Warren	72	38	53.8	8.40
Framingham	81	34	58.2	4.94
Gilbertville	80	31	57.8	6.09
Groton (1)	81	35	58.3	5.01
Heath	80	26	55.3	.....
Kendall Green	84	36	59.2	5.07
Lake Cochituate	83	31	58.0	5.31
Lawrence	81	34	58.4	5.54
Leicester	79	32	54.6	5.57
Leominster	.....	.....	.....	5.43
Long Plain*	76	38	55.8	8.00
Lowell (1)	79	36	57.6	5.66
Lowell (2)	82	34	57.2	.....
Lowell (3)	84	34	58.3	.....
Ludlow (1)	81	34	57.5	5.19
Ludlow (2)	77	29	54.6	5.50
Lynn	75	39	54.8	5.43
Mansfield	78	33	55.8	6.54
Medford	.....	.....	.....	5.71
Middleborough	77	31	55.6	5.03
Milton*	79	34	55.1	5.31
Monson	80	30	56.3	5.86
Mount Nonotuck	.....	.....	.....	4.23
Mystic Lake	.....	.....	.....	6.19
Mystic Station	.....	.....	.....	5.83
Nahant	72	40	53.4	.....
New Bedford (1)	75	38	53.8	6.69
New Bedford (2)	75	34	54.8	6.52
Newburyport (1)	82	37	56.0	6.08
Newburyport (2)	.....	.....	.....	6.88
Northampton	81	37	59.6	5.43
North Billerica	86	37	59.0	5.95
Plymouth	80	42	58.3	5.37
Princeton	76	32	55.2	4.58
Provincetown	76	38	54.4	2.99
Randolph	.....	.....	.....	6.21
Roberts' Dam	.....	.....	.....	5.65
Royalston*	78	44	58.2	.....
Salem (1)	79	42	54.8	.....
Salem (2)	.....	.....	.....	5.34
Somerset*	83	38	61.4	5.81
South Hingham	.....	30	.....	5.54
Springfield Armr'y	80	38	58.9	5.36
Taunton (1)	82	34	56.4	5.76
Taunton (2)	82	32	57.4	5.48
Taunton (3)	79	30	56.0	5.56
Wakefield	81	33	56.1	6.51
Wellesley	78	34	57.3	5.69
Westborough*	86	37	59.6	4.41
Williamstown	73	31	55.8	4.68
Worcester (1)*	81	40	58.8	5.59
Mexico.				
Leon de Aldemas	93	55	73.8	0.27
Zacatecas	87	46	65.2	0.84
Michigan.				
Adrian	90	28	55.1	5.14
Albion (1)	83	33	55.3	5.79
Allegan	.....	.....	.....	4.73
Alma	85	27	52.3	6.45
Amadore	82	30	52.2	5.17
Ann Arbor	82	33	54.0	5.19
Arbela	.....	.....	.....	5.13
Atlantic*	61	22	38.7	2.45
Ball Mountain	81	30	52.3	5.34
Bangor	90	29	57.2	4.78
Bear Lake	82	22	48.6	2.55
Bell Branch*	79	33	52.1	3.85
Benton Harbor	92	33	57.1	4.31
Benzonia	83	24	47.2	2.41
Berlin	84	30	53.4	6.21
Berrien Springs*	.....	.....	.....	5.13
Big Rapids	86	24	50.2	4.83
Birmingham	83	32	53.2	3.92
Bronson	80	32	54.3	4.88
Buchanan	83	32	54.7	5.67
Calumet	72	22	41.2	2.11
Cassopolis	88	33	55.1	5.71
Charlevoix	76	27	45.9	3.16
Chase	84	20	49.6	3.93
Cheboygan	78	24	45.0	3.10
Chelsea	86	28	53.7	6.90
Clinton	87	28	55.6	4.89
Colon	84	31	52.8	6.67
Concord	90	29	54.7	5.14
Crawford	84	26	50.9	5.21
Crystal Falls	77	20	43.6	2.70
Detroit	86	30	57.3	5.37
East Tawas	75	30	49.1	4.37
Eden	88	30	54.9	4.82
Evart	80	20	48.3	4.46
Fairview	82	29	51.9	4.86
Fitchburgh	86	28	53.8	4.97
Flint	83	28	53.9	5.02
Fort Brady	.....	.....	.....	3.35
Fort Mackinac	63	26	42.8	1.99
Fort Wayne	84	30	54.7	5.28
Fremont*	83	26	51.6	5.10
Gaylord	78	30	42.8	1.80?
Gladwin	85	25	51.8	2.77
Grand Rapids	88	27	53.3	5.33
Grape	84	29	55.6	3.31
Grayling	82	22	49.5	3.37
Gulliver Lake	76	21	44.1	3.79
Hanover	84	30	52.8	5.14
Harbor Springs	84	32	50.3	3.41
Harrison	83	25	49.5	3.96
Harrisville	73	27	44.4	3.64
Hart	83	24	49.1	5.45
Hastings	85	30	53.9	4.61
Hayes	90	29	54.0	3.47
Highland Station *	82	29	53.7	5.20
Hillsdale	87	30	56.5	4.91
Howell	84	27	51.5	5.12
Hudson	86	25	54.8	4.78
Ionia	87	20	51.5	5.17
Ivan	85	24	49.6	2.31
Jeddo	76	30	52.2	5.44
Jonesville	82	32	55.7	5.53
Kalamazoo	85	35	55.6	4.66
Lansing	84	29	53.6	6.22
Lathrop	75	21	45.1	2.80
Madison	89	30	56.8	4.49
Manton	86	22	47.5	3.08
Marshall	87	29	54.3	5.35
May	80	28	51.3	5.82
Mio	85	22	48.2	2.89
Montague	80	28	48.9	4.72
Mottville	89	28	55.9	5.28
Noble	.....	.....	.....	4.50
North Marshall	81	27	51.1	6.12
Olivet	79	29	52.2	4.60
Otsego	88	27	54.5	5.34
Ovid	86	29	52.8	5.30
Parkville	.....	.....	.....	6.58
Paw Paw	88	28	54.3	5.46
Pontiac	76	34	52.8	5.72
Pulaski*	82	30	52.3	4.96
Rawsonville *	85	32	55.7	4.37
Romeo*	84	31	52.4	6.30
Roscommon	84	22	47.8	3.60
Saint Ignace	78	24	44.1	3.45
Saint John's	86	29	51.1	4.26
Sand Beach	73	25	47.5	3.30
Stanton	83	25	50.4	6.58
Stockbridge	.....	.....	.....	4.96
Thornville	83	32	53.7	5.86
Vandalia	84	30	53.9	5.16
Vienna	.....	.....	.....	2.98
Washington	78	31	51.1	4.98
Weldon Creek	83	24	49.4	3.06
West Branch	83	24	49.2	2.94
Williamston	80	30	54.9	6.15
Ypsilanti (1)	82	28	52.2	5.02
Ypsilanti (2)	80	33	53.0	4.50
Minnesota.				
Alexandria†	.....	.....	.....	2.39
Chippewa Falls	.....	.....	.....	5.14

Meterological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Minnesota—Cont'd.	°	°	°	*Ins.*
Crookston	88	16	47.3	1.23
Farmington	84	30	52.7	3.46
Fergus Falls†	.....	.....	.....	1.71
Fort Ripley †	.....	.....	.....	3.48
Fort Snelling	86	27	51.4	4.00
Grand Meadow	89	26	50.1	3.23
L. Winnibigoshish	79	26	47.2	2.56
Leech Lake	82	20	46.3	3.43
Le Sueur *	87	33	56.1	4.09
Mankato	85	30	54.7	3.98
Medford	83	28	51.7	4.10
Minneapolis *	84	31	51.5	4.16
Montevideo	87	24	52.4	2.94
Morris	84	20	50.9	1.83
Northfield	85	26	52.6	4.14
Ortonville †	.....	.....	.....	1.15
Pine River	81	26	46.9	2.98
Pokegama Falls	81	16	45.2	1.76
Red Wing	90	30	53.7	4.55
Redwood Falls†	.....	.....	.....	5.46
Rolling Green	84	31	53.7	5.65
Saint Charles *†	85	31	50.4	3.67
Sheldon*	.....	34	54.2	2.54
Tracy †	.....	.....	.....	4.88
Mississippi.				
Aberdeen	88	38	66.5	5.03
Agricultural Col'ge	90	50	70.5	4.35
Batesville †	94	44	70.2	7.26
Booneville *	89	42	69.0	3.64
Brookhaven†	91	45	72.2	3.51
Canton	86	49	69.9	5.20
Columbus (1) †	98	41	72.2	5.35
Columbus (2)	98	40	71.0	4.92
Corinth	90	42	70.4	4.33
Edwards †	94	50	73.2	7.09
Fayette	90	51	72.6	5.30
Greenville	94	52	73.5	4.67
Hattiesburgh	91	52	74.0	2.30
Hazlehurst	91	47	72.8	0.42?
Hernando	88	36	64.8	6.11
Holly Springs (1) *	86	50	69.1	7.76
Holly Springs (2)	90	42	69.2	7.50
Jackson	93	46	72.0	2.01
Kosciusko †	86	42	69.1	3.98
Lake †	91	39	69.6	4.86
Leech Lake	88	54	73.4	4.06
Louisville †	92	40	70.1	6.04
Macon (2)	92	40	73.6	3.67
Moss Point	89	54	73.9	5.97
Natchez (1)	85	53	72.0	3.65
Natchez (2)	92	44	72.5	3.59
Okolona †	94	40	70.6	5.46
Pearlington †	88	54	73.4	4.06
Port Gibson †	91	40	71.2	4.58
Pontotoc	87	39	66.2	5.06
Rienzi	90	46	69.8	3.17
Vaiden	96	41	71.2	4.99
Washington	91	51	72.6	4.59
Water Valley *	96	46	72.2	6.83
Waynesboro' (1) †	88	45	72.0	6.90
Waynesboro' (2)	92	44	72.8	6.91
West Point	87	44	69.7	3.47
Yazoo City †	.....	.....	.....	5.99
Missouri.				
Appleton City	90	33	62.4	7.77
Bethany	.....	27	52.4	1.83
Boonville	.....	.....	.....	3.05
Brunswick	88	33	63.3	1.50
Carthage †	84	41	63.8	7.88
Cassville	86	36	62.4	8.09
Centreville	.....	31	.....	3.93
Conception	86	31	62.3	1.18
Craig	90	38	61.6	1.15
Dunnegan d	.....	38	60.8	.....
Eldon	96	40	67.2	4.38
Excelsior Springs*	90	33	60.2	3.19
Fayette †	90	32	62.8	2.62
Glasgow	88	34	62.3	2.48
Grand Pass	90	34	62.9	2.27
Harrisonville† *	92	40	58.2	5.25
Hermann †	.....	.....	.....	3.14
Ironton *	86	44	65.1	3.75
Jefferson Barracks	91	31	63.8	3.75
Kansas City	91	36	64.6	5.50
Lamar	87	32	63.6	4.19
Lamonte	90	38	66.8	1.14
Lebanon	80	40	65.6	.....
Liberty	94	33	63.8	.....
Louisiana Bridge †	.....	.....	.....	2.94
New Frankfort	86	38	62.4	2.80
New Haven *	92	37	63.8	3.00
Oak Ridge *	95	38	67.8	3.50
Pickering	.....	26 j	54.6 j	6.50h
Platt River	86	32	62.1	.....
Princeton *	91	32	62.4	6.05
Saint Charles (1)	.....	.....	.....	3.20
Saint Joseph †	.....	.....	.....	2.52
Sarcoxie	85	33	62.6	3.53
Sedalia	90	35	64.0	4.27
Shelbina	.....	.....	.....	2.10
Stellada	.....	46	63.7	.....
Thayer	.....	.....	.....	3.78
Willow Springs †	97	34	68.4	2.32
Windsor	80	48	63.7	.....
Wither's Mill *	88	40	.....	2.85
Montana.				
Blackfeet Agency	.....	26	50.6	1.53
Camp Poplar River	86	22	51.8	1.77
Custer	.....	.....	.....	0.91
Fort Assinniboine	85	31	53.7	0.80
Fort Custer	88	30	55.5	1.03
Fort Keogh	93	19	54.4	0.82
Fort Logan †	78	25	49.0	1.90
Fort Maginnis	81	29	51.0	1.09
Fort Missoula	85	34	56.1	1.92
Fort Shaw	83	32	55.0	1.85
Galpin †	.....	.....	.....	1.55
Glendive †	94	26	56.6	1.44
Kintyre	.....	.....	.....	2.48
Martinsdale	82	30	52.0	1.50
Powder River †	97	21	55.0	1.55
Virginia City	78	29	51.0	0.89
Nebraska.				
Alliance	94	26	54.6	1.24
Ansley †	94	20	58.5	3.40
Ashland	91	29	65.0	4.34
Bassett	90	34	.....	1.50k
Creighton †	92	23	55.2	3.28
Culbertson (1)	.....	.....	.....	0.65
Culbertson (2) †	98	36	58.6	0.56
David City	90	32	.....	1.13
De Soto *	92	32	59.0	3.17
Fairbury	93	32	.....	2.01
Fort Niobrara	93	14i	50.6	2.43
Fort Omaha	90	32	60.8	2.75
Fort Robinson	90	27	55.7	2.51
Fort Sidney	93	28	56.0	1.07
Franklin	91	25	60.0	1.20
Fremont*	90	32	59.9	2.67
Genoa †	90	30	59.7	3.40
Gering	89	30	55.3	1.95
Grand Island	.....	.....	.....	1.32
Grant	.....	.....	.....	1.18
Hay Springs	91	28	53.1	2.24
Hebron	92	30	63.9	1.05
Howe	84	34	63.9	3.49
Kimball	93	28	56.0	0.87
Lexington*	87	32	57.8	1.55
Long Pine	100	20	62.1	.....
Marquette (2)	98	36	.....	1.22
Minden	90	26	61.2	2.36
Mullen	.....	.....	.....	3.06
Nebraska City	85	34	60.5	2.80
North Loup* †	94	21	59.1	4.63
Oakdale	92	28	58.0	3.00
Palmer	92	28	55.5	2.00
Paxton	.....	.....	.....	0.84h
Plattsmouth †	.....	.....	.....	4.86
Ravenna	90	24	59.0	2.85
Syracuse *	89	41	62.2	2.87
Tecumseh	86	30	60.2	3.30
Tekamat	80	32	56.8	2.78
Weeping Water*	91	26	58.0	5.85
Weston	90	35	60.5	3.16
West Point	85	41	.....	0.75
Wilcox	99	28	.....	0.97
Newfoundland.				
Saint John's	72	25	46.2	2.80
New Hampshire.				
Antrim	.....	.....	.....	4.73
Belmont	.....	.....	.....	5.78
Berlin Falls	75	22	50.8	.....
Berlin Mills *	71	25	49.8	5.57
Concord	80	33	57.2	5.05
East Canterbury	76	29	56.9	5.78
Hanover (1)	77	28	54.3	5.40
Hanover (2)	73	29	54.7	5.02
Lake Village	.....	.....	.....	6.39
Manchester (1)	77	36	56.8	6.00
Manchester (2)	80	35	57.0	4.54
Mine Falls	.....	.....	.....	5.32
Nashua *	82	33	57.1	4.88
Newton	85	32	56.0	6.09
North Conway	77	25	54.1	5.32
North Sutton *	.....	38	52.7	4.85
Pennichuck Station	.....	.....	.....	4.59
Plymouth	80	25	53.8	6.24
Strafford	78	25	55.2	7.00
Walpole	75	26	54.0	4.76
West Milan	73	22	51.2	5.91
Wier's Bridge	.....	.....	.....	6.34
Wolfborough	.....	.....	.....	6.77
New Jersey.				
Allaire	85	35	54.4	.....
Asbury Park	75	39	59.2	3.83
Belleville	.....	.....	.....	5.81
Beverly †	87	36	61.0	4.46
Billingsport L. H*	85	42	64.1	.....
Bridgeton*	85	47	65.0	3.38
Cape May C. H.	80	37	60.6	4.09
Egg Harbor City	83	34	59.4	4.97
Freehold	82	34	59.2	4.28
Gillette	80	35	58.8	3.30
Hanover	84	38	62.7	.....
Highland Park	81	36	59.8	3.81
Imlaystown*	83	38	58.5	4.24
Junction	.....	.....	.....	5.98
Lambertville *	82	49	61.1	4.93
Locktown	83	35	61.1	5.59
Madison	83	34	59.5	4.94
Moorestown *	84	38	60.3	2.77

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
New Jersey—Cont'd.	°	°	°	*Ins.*
Newark (1)	80	43	60.2	4.19
Newark (2)	.....	.....	.....	4.69
New Brunswick (1)	85	33	61.2	3.93
New Brunswick (2)	81	36	59.5	4.44
New Brunswick (3)	83	34	60.8	.....
Newton	75	33	58.1	7.17
Ocean City*	76	46	58.8	3.70
Oceanic	87	41	63.4	4.27
Princeton	80	39	60.9	3.48
Rancocas	85	41	.....	2.60
Readington*	80	44	63.4	.....
South Orange	84	37	58.0	4.62
Tenafly	86	41	58.9	4.54
Trenton*	84	45	66.0	3.35
Union*	80	45	58.7	3.78
Woodbury	84	40	63.6	2.87
New Mexico.				
Albuquerque	90	42m	68.8m	0.04
Chama	85	27	54.2	0.27
Coolidge	89	29	58.2	.....
Fort Bayard	89	40	62.7	0.00
Fort Marcy	84	34	58.5	0.00
Fort Selden	104	45	72.6	0.00
Fort Stanton	90	34	60.9	0.10†
Fort Union	84	28	54.4	0.03
Fort Wingate	88	32	59.8	.....
Gallinas Spring†	89	45	66.7	0.17
Hillsborough†	93	42	66.9	0.00
Las Vegas	89	32	58.0	3.20
Los Lunas†	97	48	68.7	T.
Roswell	83	45	62.8	0.03
Springer†	.....	.....	.....	0.60
New York.				
Alabama	83	28	53.1	5.85
Alfred Centre	79	24	52.2	6.95
Angelica†	77	23	53.2	7.38
Arcade	.....	27	51.5	8.33
Ardenia*	79	43	58.3	5.05
Baldwinsville	.....	.....	.....	5.75
Boyd's Corners*	81	42	60.2	5.74
Brockport	82	30	54.6	6.65
Brookfield	74	25	52.2	7.84
Canton†	81	26	53.0	4.76
Constableville	74	22	50.5	8.43
Cooperstown	75	29	53.4	8.84
Davida Island	81	38	57.5	3.91
East Hampton	79	34	57.8	4.08
Eden	78	31	56.6	9.23
Elmira†	75	33	56.9	6.04
Factoryville†	79	26	54.5	5.62
Fleming*	77	23	52.2	7.01
Fort Columbus	80	40	56.4	2.89
Fort Hamilton	80	43	57.8	3.16
Fort Niagara	80	32	54.0	3.60
Fort Porter	76	38	53.4	4.02
Fort Schuyler	79	40	57.4	3.93
Fort Wadsworth	84	40	59.8	3.26
Geneva	85	28	53.5	6.04
Hess Road Station	82	27	57.6	6.02
Honeymead Brook*	83	29	56.4	4.64
Humphrey†	77	27	54.1	9.11
Ilion†	78	29	55.2	7.75
Ithaca	80	28	54.3	6.60
Keene Valley	76	24	48.8	4.96
Kendall	85	32	.....	5.82
Lyons	73	36	53.8	4.48
Madison Barracks	77	28	52.0	3.37
Marshland	78	23	53.5	7.83
Massena	85	24	50.3	5.07
Middleburgh†	83	31	57.5	4.15
Middletown	78	35	56.2	7.23
Mount Morris	.....	.....	.....	5.20
New Lisbon	75	29	52.2	9.18
North Hammond†	76	32	53.5	3.59
Number Four†	74	24	49.8	7.98
Ogdensburgh	80	27	51.6	.....
Palermo†	77	28	52.2	4.75
Palmyra*	81	40	55.6	.....
Peekskill	80	23	55.8	7.65
Pendleton Centre*	82	28	51.7	5.53
Perry City	76	24	52.3	6.95
Plattsburgh	73	28	52.3	5.00
Plattsburgh B'ks	70	23	50.5	4.40
Port Jervis	80	31	57.2	7.25
Potsdam*	79	21	51.0	5.08
Poughkeepsie	80	33	57.0	4.80
Quaker Street	74	29	52.5	5.91
Queensbury*	81	24	56.6	6.00
Rome	76	30	.....	7.00
Setauket	77	41	57.1	3.30
Sherman	78	30	52.6	8.26
South Canisteo	79	23	52.6	8.64
South Kortright*†	76	25	54.3	5.24
Turin*	75	32	51.3	5.69
Utica	77	28	54.9	8.69
Watervleit Arsenal	78	35	56.5	5.65
Wedgwood	78	24	51.7	7.04
West Point	80	35	56.2	5.07
White Plains*	76	42	58.5	2.92
Willets Point	82	39	59.9	3.38
North Carolina.				
Asheville (1)	.....	.....	.....	4.20
Asheville (2)	83	36	62.4	4.44
Bryson City	.....	.....	.....	5.54
Chapel Hill	96	44	69.3	4.81
N'th Carolina—Con.	°	°	°	*Ins.*
Currituck Inlet†	.....	.....	.....	2.58
Goldsborough	91	47	72.2	2.79
Highlands	78	26	57.5	7.03
Lenoir*	83	39	64.9	4.70
Lumberton	92	42	71.4	8.00
Morganton	82	40	64.0	4.80
Mount Holly†	.....	.....	.....	5.72
Mount Pleasant	90	39	68.2	4.53
Murphy	.....	.....	.....	5.40
New Berne†	88	44	71.4	5.50
Soapstone Mount*	.....	42	65.1	0.50
Wadesborough	90	42	70.0	4.52
Weldon†	87	42	68.5	5.98
North Dakota.				
Davenport	89	16	50.8	1.47
Fort A. Lincoln	80	26	49.0	0.89
Fort Buford	86	22	51.9	1.58
Fort Pembina	83	12	45.4	1.07
Fort Totten	75	21	46.8	0.79
Fort Yates	86	27	53.9	0.57
Gallatin	84	24	45.6	1.06
Grand Forks	81	16	47.4	1.21
New England City	87	16	49.3	2.35
Steele	86	18	49.8	1.35
Wahpeton	88	19	53.8	2.98
Ohio.				
Akron	83	32	56.4	7.33
Ashland*	83	39	57.4	7.42
Athens	86	30	60.2	5.29
Bangorville	84	30	56.4	7.00
Bellevue*	88	36	55.8	7.10
Bement*	89	28	56.8	6.64
Bucyrus	94	30	59.1	8.11
Caledonia†	.....	.....	.....	6.48
Canton†	84	30	57.4	7.99
Carrollton	.....	40	58.1	8.70
Celina	86	36	60.4	5.07
Circleville (1)†	.....	.....	.....	4.03
Circleville (2)	.....	.....	.....	4.35
Clarksville	85	33	60.0	5.49
Cleveland	82	32	56.4	6.39
College Hill	88	40	64.3	3.50
Columbus Barracks	88	32	59.2	5.25
Dayton	88	34	62.3	3.54
Demos	83	33	58.5	6.24
Ellsworth	.....	.....	.....	8.11
Elyria	87	32	57.4	7.72
Findlay	85	31	57.7	6.40
Fostoria	85	30	59.1	4.57
Garrettsville	81	24	54.1	7.87
Georgetown	90	35	62.0	3.39
Granville	86	32	59.0	3.36
Gratiot*	84	31	58.7	5.65
Greenville	82	34	58.8	4.66
Hanging Rock	89	35	60.7	4.93
Hassan	84	33	53.0	6.45
Hiram	81	31	55.3	7.43
Hudson	.....	.....	.....	7.68
Jacksonborough	88	36	61.3	4.35
Jefferson	78	31	53.5	6.90
Kent	80	32	57.2	5.55
Kenton*†	87	30	59.1	5.27
Leipsic	92	34	57.8	5.92
Logan	91	31	60.4	6.85
Lordstown	82	25	56.5	7.84
Mansfield†	.....	.....	.....	6.38
Marietta (2)	86	35	61.4	5.20
Napoleon†	90	31	58.9	5.77
New Alexandria	84	32	59.5	4.63
New Comerstown	86	28	57.6	5.09
North Lewisburgh	92	32	61.8	4.70
Oberlin	82	33	56.6	5.90
O. S. University	86	32	59.3	4.69
Orangeville*	82	25	57.8	7.70
Ottawa	.....	.....	.....	5.67
Pomeroy	92	33	65.2	4.40
Portsmouth (2)†	90	37	62.2	4.33
Shiloh	86	28	56.1	5.65
Springborough	.....	.....	.....	5.60
Tiffin	87	31	56.7	6.58
Upper Sandusky	85	33	58.6	7.19
Vienna*	83	30	56.2	7.24
Wapakoneta	90	34	60.5	5.49
Wauseon	88	28	56.1	4.78
Waverly	90	38	63.2	4.92
Waynesville	84	36	.....	4.71
Westerville	85	33	58.8	5.73
West Milton*	94	37	63.2	4.25
Weymouth	84	26	55.8	6.14
Wooster†	83	30	56.0	6.37
Yellow Springs	84	32	59.6	4.52
Youngstown	84	29	58.7	5.44
Zanesville†	.....	.....	.....	5.03
Oregon.				
Albany	92	38	61.4	0.39
Bandon	72	44	55.0	0.23
Beulah	87	26	56.2	0.52
Burns	83	24	54.5	0.40
East Portland	84	44	.....	0.32
Eola	84	38	57.4	0.26
Grant's Pass	98	34	61.4	0.35
Happy Valley	87	29	55.6	0.52
Heppner	88	32	58.0	0.71
Jordan Valley	85	26	54.2	2.88
McMinnville	89	36	57.8	0.64

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Oregon—Cont'd.	°	°	°	*Ins.*
Mount Angel	86	36	61.3	0.59
Pennsylvania.				
Allegheny Arsenal	88	33	61.8	5.10
Altoona	80	25	59.6	4.47
Annville	85	42	63.9	.....
Aqueduct*	80	44	61.3	10.38
Blooming Grove*	84	40	59.1	8.30
Blue Knob*	83	30	56.8	6.50
Brookville†	.....	.....	.....	7.32
Cannonsburgh	86	29	.....	5.20
Carlisle	83	34	60.1	5.47
Catawissa	78	33	58.7	7.41
Chambersburgh	82	30	59.8	5.55
Charlesville	82	28	57.4	5.65
Clarion (1)†	.....	.....	.....	9.57
Clarion (2)	80	29	56.2	7.20
Coatesville	84	33	60.5	7.85
Confluence†	.....	.....	.....	6.12
Coopersburgh	83	35	59.8	7.93
Corry	81	24	54.4	9.15
Doylestown	.....	.....	.....	5.41
Dyberry	76	25	54.0	5.56
Eagle's Mere	67	26	52.5	8.97
Easton	.....	.....	.....	5.98
Edinborough	77	29	54.3	.....
Emporium	81	28	59.5	9.61
F'ks of Neshaminy	.....	.....	60.7	5.00
Franklin*	80	30	55.2	9.98
Frankford Arsenal	85	38	61.7	2.95
Frederick	.....	.....	.....	6.87
Freeport†	.....	.....	.....	6.15
Germantown	78	42	61.2	6.50
Gettysburgh†	83	32	59.6	8.10
Girardville	76	31	58.7	12.41
Grampian Hills	80	28	57.2	6.77
Greensborough†	.....	.....	.....	9.23
Hollidaysburgh	84	29	60.0	5.82
Honesdale	76	29	56.4	6.11
Huntingdon	88	31	58.5	6.36
Johnstown	82	33	59.5	6.90
Kennett Square	74	42	61.0	6.89
Lancaster	80	34	60.3	7.04
Lansdale	.....	.....	.....	5.18
Le Roy	77	30	55.6	7.00
Lewisburgh	83	30	59.9	6.40
Lewistown	83	31	61.2	6.88
Ligonier	86	28	60.4	6.79
Lock Haven	80	29	59.2	7.30
Lock No. 4†	.....	.....	.....	7.80
Lynnport	85	29	59.0	5.00
Mahoning†	.....	.....	.....	5.63
Mauch Chunk	79	30	58.4	8.11
McConnellsburgh	80	34	60.4	7.90
Meadville (2)	79	30	53.5	7.04
Myerstown	82	32	59.8	6.79
New Castle	85	26	62.6	7.25
Nisbet*	.....	23	57.4	6.20
Oil City†	.....	.....	.....	8.50
Ottsville	.....	.....	.....	7.29
Parker's Landing†	.....	.....	.....	8.44
Petersburgh	88	30	57.6	6.96
Philadelphia	.....	.....	.....	3.34
Philipsburgh†	83	25	56.9	7.02
Point Pleasant	.....	.....	.....	5.57
Pottstown	84	37	62.8	7.61
Quakertown	81	31	59.0	6.55
Rimersburgh	88	36	56.7	.....
Salem Corners	78	31	54.8	6.93
Saltsburgh†	.....	.....	.....	5.48
Scranton	78	32	58.4	4.77
Seisholtzville	.....	.....	.....	5.99
Selin's Grove	81	34	60.8	3.56
Smith's Corners	.....	.....	.....	5.29
Somerset	82	26	55.7	8.90
South Eaton	78	30	56.3	7.47
State College	76	27	57.2	6.77
Swarthmore	82	38	60.9	5.59
Tipton	95	33	58.0	5.03
Troy*	77	31	55.0	5.68
Tuscarora	82	47	62.9	5.60
Uniontown	86	34	62.4	8.03
Warren†	.....	.....	.....	8.19
Waynesburgh	86	.....	63.4	4.90
Wellsborough*	80	26	53.5	7.80
West Chester	82	35	60.7	6.42
Westtown	82	36	61.2	5.90
Wilkes Barre	89	30	59.0	6.84
York	83	34	59.8	6.65
Rhode Island.				
Bristol	78	41	55.0	5.48
Fort Adams	70	35	52.2	3.86
Kingston (1)	77	35	54.1	4.70
Kingston (2)	75	36	54.4	5.33
Lonsdale	.....	.....	.....	5.28
Olneyville	77	39	57.8	.....
Pawtucket	.....	.....	.....	6.45
Providence (2)	80	37	57.1	4.48
South Carolina.				
Allendale	90	46	72.1	4.57
Batesburgh	94	43	72.6	4.01
Blackville	92	46	73.3	7.86
Branchville	92	40	71.2	4.42
Cheraw†	94	42	72.3	4.13
Chester	95	36	69.0	3.52
Florence†	92	49	72.8	4.86

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
South Carolina—Con.	°	°	°	*Ins.*
Greenville†	88	38	68.0	8.03
Greenwood	90	42	70.2	6.71
Hardeeville	90	45	72.7	4.51
Jacksonborough	92	42	71.0	2.53
Kingstree	90	42	71.2	7.14
Kirkwood*	.....	48	67.6	4.19
McCormick	.....	.....	.....	6.12
Port Royal*†	85	54	73.5	2.66
Saint George's	88	42	70.8	6.17
Saint Matthew's	94	45	72.6	8.60
Simpsonville	95	42	72.0	11.61
Spartanburgh (1)	92	30	68.7	8.39
Spartanburgh (2)†	90	40	67.0	9.88
Statesburgh	86	46	70.2	6.13
South Dakota.				
Aberdeen	93	15	52.2	2.04
Alexandria	90	23	55.4	3.80
Brookings	90	23	52.4	3.33
Canton	91	23	56.2	3.64
Clark	93	24	54.0	3.10
Cross	.....	32	52.0	2.28
De Smet*	.....	33	50.7	3.19
Flandreau	.....	20	.....	4.85
Fort Bennett	91	24	57.4	1.53
Fort Meade	91	27	54.4	2.31
Fort Randall	92	27	55.0	2.06
Fort Sully	93	30	58.6	1.27
Highmore	93	27	55.0	0.83
Kimball	.....	25	54.0	2.03
Milbank	.....	30	47.4	1.54
Oelrichs	91	24	52.8	2.59
Onida*	90	22	51.0	0.22
Parkston	88	28	54.7	2.10
Scranton	94	33	55.5	0.66
Spearfish*	83	28	54.4	3.42
Vermillion	88	28	56.0	2.37
Webster	90	20	52.7	3.58
Wolsey*	96	19	54.8	1.81
Woonsocket	96	23	53.5	2.42
Tennessee.				
Andersonville	85	36	64.5	5.69
Arlington†	92	40	65.0	4.65
Ashwood*†	88	42	66.0	3.18
Austin†	88	38	66.6	5.97
Bolivar (2)	86	40	66.6	5.74
Brownsville	92	46	70.3	3.87
Carthage†	.....	.....	.....	4.05
Charleston†	.....	.....	.....	5.54
Clarksville	87	39	66.0	4.57
Clinton†	.....	.....	.....	6.71
Cog Hill	92	50	64.4	2.30
Columbia†	.....	.....	.....	4.01
Covington (1)	86	49	67.7	5.51
Covington (2)	90	42	67.0	4.87
Dyersburgh†	96	40	69.4	3.89
Fayetteville	92	40	66.9	4.04
Florence Station	86	45	65.3	4.25
Grand Junction	88	41	67.3	6.79
Greeneville	81	38	62.7	5.80
Grief	88	38	62.3	5.29
Hohenwald	88	34	65.8	4.82
Jacksborough	84	37	64.6	7.23
Johnsonville†	.....	.....	.....	2.52
Kingston (1)	.....	.....	.....	4.73
Kingston Springs	86	33	66.2	4.23
Lawrenceburgh	88	32	62.3	3.30
Lewisburgh	90	42	65.0	3.95
Loudon	.....	.....	.....	4.48
Lynnville	86	34	63.1	3.70
McKenzie	90	37	60.4	4.38
Milan (1)	88	39	66.0	3.99
Milan (2)	94	37	67.6	3.72
Nunnelly	86	33	65.4	4.26
Parksville	87	39	66.2	6.24
Riddleton	90	38	64.8	5.49
Rockwood†	.....	.....	.....	4.58
Rogersville	85	41	64.0	4.59
Rugby	84	38	62.9	6.32
Savannah	88	42	66.5	4.06
Sharp's	90	40	67.3	3.40
Springdale	89	42	67.2	6.63
Strawberry Plains†	.....	.....	.....	4.62
Trenton	85	39	64.7	3.11
Watkins	91	40	65.0	4.17
Waynesborough	92	32	64.8	3.48
Woodstock	91	34	71.5	4.90
Texas.				
Austin (2)*	95	56	76.4	.....
Brady	91	46	71.1	2.68
Brazoria†	89	55	74.3	5.25
Brenham†	93	54	76.0	3.53
Brownwood†	94	47	74.1	3.18
Caddo Peak*	94	50	71.1	14.28
Camp Eagle Pass	102	56	77.7	2.65
C'p Peña Colorado	96	41	70.4	3.05
Childress	94	47	72.4	1.23
College Station	95	55	72.5	4.33
Columbia	92	60	75.2	8.33
Corsicana (2)	94	50	73.8	6.25
Dallas (2)	92	54	76.2	3.75
Duval	96	37	75.8	3.55
Edinburgh†	.....	.....	.....	2.32
Epworth†	86	52	70.9	0.95
Forestburgh*	.....	54	67.2	1.30
Fort Bliss	100	50	75.0	0.00

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Texas—Cont'd.	°	°	°	*Ins.*
Fort Brown	89	55	70.8	2.27
Fort Clark	94	54	76.0	1.75
Fort Davis	94	45	74.3	0.93
Fort Elliott	92	36	67.0	1.62
Fort Hancock	105	38	73.1	0.13
Fort McIntosh	97	54	78.2	5.80
Fort Ringgold	103	62	81.0	2.41
Fredericksburgh	90	49	70.4	3.42
Gallinas †	95	47	72.9	4.17
Graham †	93	43	69.9	3.78
Haskell	95	50	73.2	3.41
Hearne	90	52	74.1	4.75
Houston †	97	49	77.2	4.41
Howe	89	49	69.0	3.87
Huntsville †	91	50	74.0	2.80
La Grange	.....	60	73.4	4.43
Lampasas	95d	48d	74.6d	4.49
Longview †	96	50	74.9	5.43
Luling	94	54	75.3	4.74
Menardville * †	93	45	71.5	1.18
Merkel	.....	54	68.4	3.05
Mesquite	94	48	72.4	4.80
Miami †	.....	.....	.....	0.11
Mountain Spring	80	50	65.3	1.38
New Braunfels	92	54	71.2	3.82
New Ulm	98	55	75.6	4.07
Ochiltree *	80	40	63.2	2.16
Orange	90	66	78.8	2.87
Panhandle †	91	42	64.2	1.26
Panter	93	57	72.9	3.07
Paris	92	48	72.1	2.05
Pike	94	47	72.5	3.68
Round Rock	88	50	74.5	1.26
San Antonio	93	55	74.3	2.39
Santa Maria	.....	.....	.....	0.50
Silver Falls	95	42	69.7	2.75
Tyler	94	48	73.5	0.03
Waco (2) †	92	53	75.6	7.90
Weatherford	90	46	71.6	2.07
Utah.				
Beaver †	88	30	59.8	0.12
Fort Douglas	84	40	61.3	0.16
Fort DuChesne	87	28	60.9	0.00
Levan	.....	44	56.5	0.48
Loseef	90	37	58.5	0.40
Moab	102	36	68.8	T.
Mount Carmel * †	87	34	51.0	0.27
Mount Pleasant	63	27	46.6	0.53
Nephi †	87	28	58.6	0.67
Ogden (2) *	87	49	67.8	0.85
Price	.....	.....	.....	0.00
Richfield	88	31	59.4	0.06
Vermont.				
Brattleborough (1)	80	31	57.7	5.00
Brattleborough (2)	78	34	56.2	.....
Burlington	79	35	.....	6.12
Chelsea *	68	34	51.3	5.35
Cornwall	.....	.....	.....	5.49
East Berkshire †	77	21	51.2	6.16
Hartland	76	28	54.3	6.50
Jacksonville	78	25	52.6	5.87
Lunenburgh *	78	32	56.9	6.59
Strafford *	70	28	54.4	7.60
Vernon	78	34	56.7	5.19
Weathersfield C'tre	72	29	52.4	.....
Virginia.				
Abingdon	.....	.....	.....	4.27
Alexandria	85	41	63.9	4.46
Birdsnest *	88	48	66.3	7.05
Bolar *	78	34	54.6	6.95
Christiansburgh †	87	34	61.4	5.50
Dale Enterprise †	89	40	64.7	5.68
Fall Creek Depot	88	48	69.5	3.71
Fort Monroe	87	47	67.5	6.86
Fort Myer	85	40	62.4	4.85
Lexington †	88	32	63.3	3.93
Liberty	.....	45	62.0	3.85
Marion	85	35	62.8	6.51

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Virginia—Cont'd.	°	°	°	*Ins.*
Mossingford †	85	50	67.6	5.91
Nottaway C. H.	90	36	67.4	7.08
Petersburgh †	89	40	67.8	5.31
Richmond †	87	40	67.1	4.50
Salem	87	41	64.9	3.83
Smithfield *	85	50	67.7	7.31
Staunton	84	39	62.4	3.75
Summit	83	35	61.5	.....
Woodstock †	.....	.....	.....	5.53
Washington.				
Blakeley †	78	37	57.4	0.45
Chehalis	.....	34	52.4	0.80
Doe Bay	70	40	52.8	1.25
Fort Canby	72	44	55.7	1.95
Fort Simcoe	89	51	66.8	0.28
Fort Spokane	94	36	60.3	2.40
Fort Townsend	75	37	54.7	0.94
Fort Walla Walla	91	36	62.5	0.98
Vancouver B'ks	85	30	60.8	1.10
Waterville	92	35	57.4	1.67
West Indies.				
Hamilton, Bermuda	76	63	71.5	6.01
West Virginia.				
Buckhannon †	.....	.....	.....	6.03
Charlestont	.....	.....	.....	7.55
Ella *	81	40	59.6	0.93
Glenville	.....	.....	.....	5.46
Harper's Ferry †	.....	.....	.....	4.56
Hinton	.....	.....	.....	4.40
Kingwood *	85	30	52.6	.....
Morgantown †	.....	.....	.....	8.10
Mount Alto	.....	38	56.6	.....
Oceana	90	43	62.3	6.43
Pleasant Hill *	84	40	57.4	.....
Point Pleasant †	.....	.....	.....	5.58
Rowlesburgh (1) †	.....	.....	.....	8.09
Seven Pines	85	32	59.9	.....
Tannery *	84	34	60.6	.....
Weston †	.....	.....	.....	9.06
Wheeling †	.....	.....	.....	6.65
White Sulp'r Sp'gs	.....	.....	.....	3.47
Wisconsin.				
Butternut *	.....	26	44.2	3.73
Cadix *	.....	36	53.6	0.46
Delevan	89	32	52.5	4.69
Embarrass *	84	28	52.2	4.40
Fond du Lac	85	24	51.2	3.85
Greenwood †	84	24	47.5	4.35
Honey Creek *	92	30	54.8	5.35
Horicon	.....	32	50.5	2.13
Lincoln *	.....	31	49.4	2.91
Madison	84	33	52.9	5.03
Manitowoc	78	24	49.6	3.33
Medford †	.....	.....	.....	4.38
Neillsville *	92	22	48.3	.....
Oshkosh	83m	29	50.89	4.75
Phillips †	.....	.....	.....	4.23
Portage †	.....	.....	.....	5.40
Potosi	.....	.....	.....	6.25
Summit Lake * †	92	28	46.8	3.55
Waucousta	.....	32	51.3	.....
Wauzeka *	.....	32	51.3	.....
Weston †	.....	30	47.2	3.83
Wyoming.				
Camp Pilot Butte	80	29	54.5	0.39
Camp Sheridan	77	26	49.7	1.86
Carbon *	78	36	53.3	1.16
Fort Bridger	76	30	53.2	0.43
Fort D. A. Russell	92	5	52.1	1.93
Fort Fetterman	92	29	54.8	T.
Fort McKinney	86	28	54.0	1.55
Fort Washakie	82	8	48.7	0.58
Owen	74	28	49.6	2.91
Saratoga *	80	34	52.3	4.46
Wheatland	69	.....	.....	1.01
Sandwich Islands.				
Honolulu	85	61	74.3	2.25

Reports received too late to be used in general discussion of weather for May, 1890.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Alabama.				
Butler	87	44	71.7	7.40
Carrollton	87	46	69.7	5.24
Chepultepec	76	51	64.9	.....
Gadsden	92	58	68.9	5.68
Greensborough	.....	.....	70.9	4.58
Guntersville	87	47	64.9	1.32
Jasper	84	40	69.9	3.55
Mount Willing	86	46	70.3	6.65
Tuscumbia	88	43	66.9	3.71
Union Springs	85	55	72.7	4.99
Uniontown	87	48	72.4	3.10
Arizona.				
Agua Caliente	105	48	74.2	.....
Benson	97	62	79.0	0.00
Maricopa	106	64	84.8	0.00
Pantano	100	58	76.6	0.00
San Simon	105	55	77.3	0.00
Texas Hill	110	68	83.4	0.00
Tucson (1)	96	49	78.5	0.00

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
Arizona—Cont'd.	°	°	°	*Ins.*
Wilcox	101	50	73.9	0.00
Yuma	98	65	81.4	0.00
California.				
Alcade	104	50	71.9	0.00
Almaden	94	46	63.3	1.35
Anaheim	92	60	68.6	T.
Antioch	99	50	69.5	0.54
Aptos	75	50	61.0	1.66
Athlone	102	51	71.2	0.72
Bakersfield	103	58	75.4	0.06
Beaumont	90	50	64.3	1.05
Belmont	94	47	66.6	0.00
Berendo	103	55	71.9	0.64
Bishop Creek	99	49	74.4	0.00
Boca	88	29	52.5	0.70
Borden	105	50	69.3	0.51
Boulder Creek	100	38	64.0	1.60
Brentwood	101	40	69.8	0.37
Brighton	96	52	68.2	1.40

Reports received too late, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
California—Cont'd.	°	°	°	*Ins.*
Castroville	74	50	60.6	0.67
Caliente	103	40	73.6	1.62
Chico	98	50	68.7	1.87
Cisco	57	32	43.3	2.50
Colfax	92	42	61.9	3.85
Colton	94	48	68.5	0.00
Corning	100	50	70.1	2.34
Davisville	97	48	66.1	2.21
Delano	105	52	73.1	0.61
Delta	96	42	66.6	2.33
Dunnigan	103	47	72.2	1.91
Dunsmuir	100	45	66.3	2.45
Edgewood	87	43	58.5	1.60
El Dorado	97	48	67.0	3.45
Elmira	102	50	70.0	1.86
El Verano	95	49	63.9	1.39
Emigrant Gap	80	32	51.2	3.37
Esparto	102	48	67.0	1.58
Farmington	99	52	68.5	1.14
Felton	98	42	67.3	1.64
Fernando	94	50	64.6	0.10
Florence	84	50	65.2	0.00
Folsom	100	52	66.4	2.66
Fresno	108	50	74.1	0.25
Girard	90	40	60.8	1.05
Gilroy	95	49	63.7	0.55
Glen Ellen	100	49	62.7	1.85
Goshen	103	53	70.1	0.17
Hollister	92	48	66.1	0.31
Haywards	85	49	61.5	1.01
Hornbrook	94	42	62.7	0.44
Indio	110	64	83.7	0.00
Ione	95	50	65.1	2.05
Julian	83	43	60.1	2.54
Kings City	98	42	64.1	0.13
Keeler	95	58	77.0	0.14
Keene	94	48	66.9	1.30
Kingsburgh	97	53	73.8	0.57
Knights Landing	85	50	66.9	1.93
La Grange	104	46	68.6	1.42
Lathrop	97	49	71.4	0.34
Lowell	93	47	62.8	2.50
Lemore	101	53	71.1	0.22
Los Angeles	98	48	67.1	0.07
Los Gatos (1)	98	50	66.8	1.34
Mammoth Tank	111	65	83.6	0.00
Martinez	92	50	63.9	0.74
Marysville	98	50	70.2	2.55
Menlo Park	96	47	62.8	1.48
Modisto	96	49	69.3	0.59
Mojave	105	46	72.1	.....
Montague	98	50	67.0	0.82
Monterey	76	44	57.4	0.37
Monterey (Hotel del Monte)	80	47	59.7	.....
Napa	99	50	64.5	1.91
Newark	92	55	66.4	1.05
Newhall	95	42	62.3	.....
Newman	96	50	70.8	0.20
Norwalk	99	50	67.4	0.05
Oakland (2)	74	54	61.2	1.01
Ogilby	110	67	87.4	0.02
Ontario	99	40	71.0	.....
Orland	105	47	71.0	1.75
Oroville	101	46	70.0	3.84
Pajaro	80	42	59.3	0.47
Paso Robles	88	43	65.8	0.22
Petaluma	100	52	67.3	1.29
Placerville	97	42	64.9	4.01
Pomona	95	55	66.4	0.00
Porterville	108	56	77.7	0.20
Puente	94	54	66.1	0.02
Red Bluff	98	46	68.9	2.34
Redding	108	48	65.7	2.24
Rocklin	104	50	68.6	1.78
Rumsey	98	52	71.5	1.29
Sacramento (2)	84	53	66.7	1.60
Salinas	80	48	57.5	0.52
Salton	110	57	81.7	0.00
Sanger Junction	108	53	75.8	0.00
San Ardo	99	50	.....	0.43
San Gabriel	96	56	68.3	0.00
San Jose	93	46	63.5	0.75
Santa Maria	86	41	61.7	0.13
San Mateo	86	48	60.7	0.58
San Miguel	98	45	63.7	0.18
San Pedro	87	57	64.7	0.00
Santa Ana	90	56	67.0	0.35
Santa Barbara (2)	87	55	65.1	0.13
Santa Cruz	88	49	62.6	1.22
Santa Margarita	95	45	64.7	0.32
Santa Monica	89	50	67.0	0.00
Santa Paula	94	54	68.1	0.00
Santa Rosa	95	43	60.6	1.40
Selma	100	56	81.7	1.19
Seven Palms	110	52	81.7	0.00
Shingle Springs	87	44	57.8	2.75
Sims	95	45	63.0	2.64
Sisson	89	36	61.4	2.75
Soledad	92	46	61.3	0.04
Soquel	84	48	64.8	0.00
South Side	96	35	62.4	0.00
South Vallejo	89	45	58.6	1.01
Spadra	88	52	69.6	0.03
Stockton	92	55	67.8	0.65

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean.	Precip'n.
California—Cont'd.	°	°	°	*Ins.*
Suisun City	102	48	65.8	1.02
Tehachapi	85	30	59.6	0.00
Tehama	95	50	71.1	1.45
Templeton	98	49	63.9	0.22
Towles	87	32	60.3	.....
Tracy	96	48	69.0	0.19
Traver	98	55	73.2	0.81
Tropico	99	50	68.2	0.00
Truckee	82	30	47.2	1.44
Tulare	104	56	74.4	0.20
Turlock	98	53	70.6	0.53
Vacaville	90	48	67.7	1.40
Valley Springs	95	45	66.0	2.35
Vina	98	46	70.9	2.11
Volcano Springs	116	68	88.9	.....
Whittier	98	51	67.0	0.00
Williams	99	52	71.7	1.77
Willow (1)	99	43	66.2	1.89
Willow (2)	93	34	69.3	0.55
Winters	100	53	74.3	1.48
Woodland	87	44	63.8	1.60
Colorado.				
Agate *	88	22	53.9	.....
Aroya	.....	.....	.....	1.44
Bennet	89	34	44.3	1.75
Byers *	84	40	62.4	.....
Cheyenne Wells *	90	35	59.0	.....
Deer Trail *	84	38	52.6	T.
First View *	90	34	60.8	0.97
Hugo *	90	35	59.8	.....
Kit Carson	85	50	65.6	0.40
Magnolia *	87	29	52.8	3.00
Palmer Lake	79	29	52.1	1.01
River Bend	92	35	57.4	.....
Watkins	82	42	59.9	0.75
Florida.				
Altamonte Springs	92	56	76.2	5.59
Georgia.				
Diamond	80	40	64.8	11.60
Kansas.				
Green Ridge	89	30	62.2	1.12
Mexico.				
La Logia	98	58	82.6	0.00
Missouri.				
Brunswick	90	33	63.1	1.50
Montana.				
Sheldon	86	42	58.6	.....
Nebraska.				
Kennedy † *	96	.....	.....	2.57
Nevada.				
Austin	82	23	55.1	1.48
Belmont	79	30	53.3	1.18
Beowawe *	85	43	64.9	1.76
Browns	92	50	69.9	0.88
Candelaria	82	31	59.4	0.35
Carlin	87	40	58.8	1.60
Carson City	91	30	58.4	0.43
Columbus Marsh	96	38	63.0	.....
Crane's Ranch	.....	.....	.....	2.09
Downeyville	88	34	61.5	1.39
Elko (1)	83	34	57.2	1.17
Elko (2)	90	28	56.2	1.90
Ely	85	28	55.4	0.70
Eureka	86	26	56.2	1.72
Fenelon	91	41	61.5	1.00
Genoa	83	30	56.4	0.70
Golconda	92	36	62.3	2.42
Gold Mountain	84	29	60.3	0.58
Halleck	88	40	59.2	1.00
Hawthorne (1)	88	46	66.0	0.17
Hot Springs (1)	95	35	58.3	0.07
Hot Springs (2)	95	35	55.1	0.07
Humboldt *	86	40	59.1	2.01
Lewers Ranch	90	30	57.6	1.04
Palisade *	85	40	60.6	1.70
Palmetto	89	27	54.4	0.21
Pioche	.....	.....	.....	1.00
Reno *	82	40	59.8	0.31
Reno, State Univ'y	84	29	57.3	1.44
Ruby Hill	76	25	48.9	0.50
Sodaville	92	27	63.9	1.50
Tecoma	89	35	64.3	1.40
Virginia City	84	28	57.4	1.27
Wadsworth	96	46	67.7	1.10
Wells	85	35	60.5	1.32
Westley	98	53	74.0	0.33
Whittier	98	51	67.0	.....
Winnemucca	99	32	64.8	0.55
Yount's Ranch	94	42	68.3	0.00
New Mexico.				
Antelope	.....	.....	.....	0.09
Deming	98	61	75.2	0.00
Estalina Springs	.....	.....	.....	0.05
Lordsburg	97	60	79.5	0.00
Monero	.....	.....	.....	0.00
Pojaque	.....	.....	.....	0.00
San Marcial	.....	.....	.....	0.27
North Carolina.				
Clear Creek	88	38	66.4	1.85
Douglas	95	35	67.6	5.70
Franklin	86	28	60.6	3.00
Hot Springs	86	41	64.1	.....
Mount Airy	88	34	64.3	6.32
Oak Ridge	92	40	66.4	4.44
Pittsborough	85	41	66.8	5.55

Reports received too late, etc.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
N'th Carolina—Con.	°	°	°	*Ins.*
Raleigh	92	50	71.0	3.48
Salisbury	89	51	71.1	4.64
Washington	89	54	72.0	3.10
Willeyton	86	41	67.6	2.85
Winslow	91	41	68.7	6.20
Oregon.				
Ashland (1)	84	38	59.7	1.90
Ashland (2)*	88	36	58.2	1.91
Cascade Locks	.....	.....	.....	0.75
Corvallis	84	34	58.7	0.29
Ellensburgh	83	43	55.4	1.01
Forest Grove	89	36	59.7	0.31
Gardiner	82	42	56.8	0.88
Hood River	88	40	63.4	0.19
Jacksonville	88	35	60.0	1.62
Joseph	83	28	52.9	1.62
La Grande	87	32	56.6	3.24
Lone Rock	82	28	55.2	0.48
North Powder	84	24	53.6	1.94
Pendleton	91	30	60.1	1.51
Siskiyou	85	38	58.2	1.20
Vernonia	88	39	55.8	1.00
Weston	88	34	59.0	0.24
Pennsylvania.				
Pleasant Mount	.....	33	52.7	6.10

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
South Carolina.	°	°	°	*Ins.*
Belmont	87	42	69.8	6.33
Blackville	92	46	73.3	7.86
Evergreen	88	36	66.2	9.08
Timmonsville	86	52	73.4	5.20
Trial	86	41	74.0	8.05
Walhalla	82	49	67.2	7.55
Winnsborough	91	42	71.3	3.60
Yorkville	88	40	70.0	5.78
Texas.				
Belton	94	46	75.1	2.16
Burnet	89	60	70.4	2.22
Cuero *i*	96	62	78.4	2.22
Gainesville	90	52	70.7	2.57
Utah.				
Blue Creek	89	49	68.7	0.95
Corinne	88	52	66.2	1.10
Ogden (1)	86	34	61.3	0.85
Promontory	76	35	60.0	0.00
Snowville	83	41	58.9	1.97
Terrace	87	48	68.8	0.15
West Virginia.				
Tyler Creek	90	45	63.6	9.85
Wisconsin.				
Glasgow	.....	30	50.7	4.41
Waucousta	.....	22	48.0	.....

Reports received too late for publication in April, 1890.

Alaska.				
Killisnoo	46	15	31.4	0.90
Arizona.				
American Flag	.....	.....	.....	0.57
Benson*	87	42	66.2	0.23
Calabasas	.....	.....	.....	0.21
Casa Grande*	95	45	70.8	0.38
Chloride	.....	.....	.....	0.70
Dudleyville	.....	.....	.....	0.75
Maricopa*	98	52	74.9	0.00
New River	92	38	65.9	0.37
Oro	.....	.....	.....	0.47
Pantano*	95	40	67.0	0.79
Red Rock	.....	.....	.....	0.25
Saint John	.....	.....	.....	0.73
San Simon	90	40	64.5	0.00
Simmons	.....	.....	.....	0.08
Tempe	.....	.....	.....	0.33
Texas Hill*	100	58	73.1	0.00
Tucson (2)*	96	41	67.2	0.10
Wilcox*	85	40	65.6	0.41
Yuma*	91	60	72.3	0.00
Arkansas.				
Camden	81	41	64.5	.....
Conway	81	40	62.8	12.18
Dallas	72	42	59.5	11.55
Harrisburgh	83	39	61.1	8.39
Heber	84	40	61.4	§5.10
Lonoke	87	41	65.1	11.88
Osceola	80	35	62.3	5.93
Ozone †	80	33	59.0	12.83
Pine Bluff †	88	40	65.4	4.73
Stuttgart †	84	38	63.3	7.73
Texarkana †	85	40	65.1	7.95
Washington †	88	39	64.9	10.34
California.				
Alcade	89	40	62.0	0.00
Almaden*	84	41	56.1	0.65
Anaheim*	92	50	65.0	0.00
Antioch*	78	48	60.4	0.31
Arcata	.....	.....	.....	2.26
Athlone*	93	43	63.8	0.54
Auburn*	81	45	58.6	2.83
Bakersfield*	88	48	65.3	0.00
Beaumont	82	47	59.8	1.15
Belmont*	82	45	56.0	0.00
Berendo*	93	42	62.2	0.65
Borden	90	45	62.2	0.26
Boulder Creek	90	29	58.3	2.29
Brentwood*	90	50	70.1	0.92
Brighton*	90	51	64.0	1.45
Byron*	80	48	62.8	0.38
Castroville*	87	42	56.8	0.57
Caliente*	93	35	58.9	0.00
Calistoga*	84	36	54.7	2.25
Chico*	86	46	61.3	1.97
Cisco*	50	26	37.3	1.50
Colfax*	80	40	55.8	3.95
Colton*	88	44	65.8	0.00
Corning*	89	48	64.6	1.25
Davisville*	89	42	59.7	1.60
Delano*	94	42	65.2	0.08
Delta	84	43	59.5	4.78
Downey*	91	58	68.2	0.00
Dunnigan*	88	45	62.5	1.16
Dunsmuir	62	27	43.0	11.85
Edgewood	67	35	48.1	0.70
El Dorado*	83	45	60.6	3.00
Elmira*	88	48	62.4	1.05
El Verano*	80	44	57.0	1.64
Emigrant Gap*	55	28	41.4	1.72
Escalante	86	50	61.4	0.83
Farmington*	81	45	59.8	1.37
Felton*	90	40	59.0	3.29
Fernando	89	43	61.9	0.05
California—Cont'd.				
Florence*	90	50	65.5	0.00
Folsom*	82	45	61.8	2.08
Fresno*	88	47	64.3	0.29
Fruto*	85	46	62.3	0.81
Girard*	84	37	53.3	0.40
Gilroy*	85	49	58.3	0.64
Glen Ellen*	85	41	57.8	2.21
Goshen*	88	43	63.5	0.32
Hollister*	90	45	59.5	0.52
Haywards*	78	45	53.5	1.31
Indio*	102	55	75.5	0.00
Ione*	84	40	53.9	2.50
King City*	83	35	56.2	0.00
Keeler	86	50	67.6	0.00
Keene*	82	41	55.4	0.50
Kingsburgh*	90	48	65.3	0.42
Knight's Landing*	78	48	60.8	1.02
Lathrop*	90	43	59.9	0.63
Laurel*	87	45	58.3	2.52
Lemoore	96	38	64.5	0.22
Livermore	86	36	55.4	0.86
Livingston*	86	43	59.2	0.73
Long Beach	90	46	62.2	0.00
Los Angeles*	94	48	61.9	0.15
Los Gatos (1)	85	50	62.7	1.03
Mammoth Tank*	100	60	77.8	0.00
Martinez	74	42	55.8	0.86
Marysville	90	50	66.1	1.85
Menlo Park*	82	40	57.0	0.51
Merced*	83	43	59.1	0.39
Modesto*	85	44	61.6	0.63
Mojave*	91	42	62.8	0.00
Montague*	90	44	58.3	0.33
Monterey*	74	40	52.1	0.34
Monterey (H. del M)	80	42	54.7	.....
Mount Hamilton	71	31	47.6	1.79
Napa*	84	40	56.2	2.08
National City	84	40	58.4	0.13
Newark*	78	45	60.0	0.85
Newhall	91	42	57.0	0.33
Newman*	86	48	59.9	0.70
Niles*	82	45	58.9	1.16
Norwalk*	89	45	63.9	0.13
Oakland (2)*	82	48	55.3	1.18
Ogilby	101	56	73.7	0.00
Ontario	93	51	64.2	0.01
Orland*	94	50	65.0	0.53
Oroville	86	44	62.5	2.47
Pajaro*	89	42	54.9	0.69
Paso Robles*	84	38	58.1	0.03
Petaluma*	84	46	56.2	1.24
Placerville (1)	82	44	57.8	3.36
Pleasanton	65	35	52.0	2.24
Pomona	103	37	62.0	0.00
Porterville	87	45	62.9	0.12
Puente*	90	49	62.8	0.00
Red Bluff*	90	48	62.6	1.62
Redding*	93	46	63.7	3.12
Rocklin*	85	42	62.0	2.15
Rumsey*	82	49	62.7	1.17
Sacramento (2)*	73	49	60.0	1.12
Salinas (2)*	84	47	55.7	0.56
Salton*	100	51	73.4	0.00
Sanger Junction*	98	45	66.8	0.11
San Ardo*	90	40	57.3	0.00
San Gabriel*	93	50	62.5	0.00
San José*	82	43	56.7	0.55
San Mateo*	82	44	53.6	0.79
San Miguel*	86	42	57.9	0.00
San Pedro*	86	49	61.2	0.00
Santa Ana*	94	46	63.1	0.00
Santa Barbara (2)*	86	54	65.0	0.25
Santa Cruz*	84	44	58.1	1.06
Santa Margarita*	82	42	56.2	0.00

Reports received too late, &c.—Continued.

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
California—Cont'd.	°	°	°	*Ins.*
Santa Monica*	84	49	61.3	0.00
Santa Rosa*	78	40	54.7	1.82
Selma	86	46	65.2	0.25
Seven Palms*	106	59	78.1	0.00
Sims*	87	27	53.1	5.53
Sisson*	71	17	47.6	2.98
Soledad*	88	34	55.3	0.00
Soquel*	86	40	59.7	0.00
South Side*	80	38	57.9	0.00
Spadra*	92	48	77.2	0.00
Stockton (2)*	72	45	59.3	1.21
Suisun City*	82	46	59.7	1.10
Summit*	41	31	34.9	2.60
Tehachapi	81	36	51.3	0.00
Tehama	90	58	70.1	0.75
Towles*	74	34	51.6	.....
Tracy*	81	43	56.2	0.97
Traver*	90	44	64.0	0.35
Tropico*	91	40	61.4	0.04
Truckee*	68	20	38.8	0.45
Tulare*	96	45	66.2	0.22
Turlock*	85	45	62.5	0.80
Vacaville (2)*	80	48	60.0	0.96
Valley Springs*	85	43	59.9	1.75
Vina*	84	50	63.2	0.00
Volcano Springs*	106	50	79.2	0.03
Williams*	85	50	63.1	0.65
Willow (1)†	90	30	57.7	0.55
Willow (2)	83	37	58.4	0.62
Winters*	86	50	64.8	0.97
Woodland*	76	42	59.4	1.00
Colorado.				
Longmont	80	15	49.0	5.72
Minneapolis	.....	.....	.....	6.31
Palmer Lake	71	11	43.4	3.69
Idaho.				
Mullan	81	23	40.2	0.50
Illinois.				
Palestine	82	29	55.3	4.07
Iowa.				
Larrabee*	80	16	48.8	3.29
Muscatine	82	25	52.2	1.12
Kansas.				
Cawker City	86	32	54.5	1.20
Coldwater	.....	.....	.....	2.50
Elco	90	30	56.7	3.27
Eureka Ranch	92	26	55.5	3.42
Green Ridge	91	25	52.6	3.50
Mankato	95	25	48.6	0.62
Maryland.				
Leonardtown	.....	.....	53.0	3.25
Mississippi.				
West Point	88	45	64.6	3.12
Montana.				
Sheldon	88	26	46.6	0.17
Nebraska.				
Bingham	80	12	46.6	1.63
New Mexico.				
Antelope Springs	.....	.....	.....	1.57
Embudo	.....	.....	.....	2.39

Stations.	Temperature. (Fahrenheit.) Max.	Min.	Mean	Precip'n.
New Mexico—Cont'd	°	°	°	*Ins.*
Estalina Springs	.....	.....	.....	0.40
La Luz	90	28	64.2	0.15
Lordsburgh	86	33	64.4	0.13
Magdalena	.....	.....	.....	0.80
Monero	.....	.....	.....	1.27
Pojuaque	.....	.....	.....	2.48
Tres Piedras	.....	.....	.....	2.50
Wallace	.....	.....	.....	1.50
New York.				
Adelphi Academy	76*f*	33*f*	49.6*f*	.....
Nevada.				
Battle Mountain	77	40	55.2	0.95
Beowawe (2)	80	33	52.4	0.70
Brown's*	86	38	58.9	0.36
Carlin	74	28	54.2	1.10
Elko (1)*	80	28	46.5	1.41
Golconda*	70	30	45.9	0.10
Hot Springs (1)*	80	25	47.3	0.04
Humboldt (1)	82	28	50.0	1.37
Palisade (2)	80	27	48.5	1.00
Reno (1)	75	23	49.0	0.30
Reno (2)	76	26	50.6	0.16
Tecoma*	78	35	54.8	0.15
Templeton	86	38	58.6	0.16
Toano	78	24	50.7	0.71
Wadsworth	86	30	55.7	0.04
Wells	80	25	50.5	0.05
Westley	83	45	64.2	1.13
Whittier	97	50	65.2	0.00
Winnemucca	61	23	43.8	0.62
North Carolina.				
Clear Creek*	86	30	59.2	1.80
Douglas	87	25	56.9	3.00
Franklin*	84	28	56.1	2.20
Hot Springs	84	33	58.1	.....
Pittsborough*	86	30	57.0	1.68
Raleigh	88	35	61.0	1.45
Salisbury	81	37	60.9	2.16
Willeyton	86	26	58.8	3.10
Winslow*	88	30	60.2	1.40
North Dakota.				
Grand Forks	82	18	43.0	0.34
Oregon.				
Beulah	82	16	47.6	0.37
Happy Valley	81	17	46.4	1.38
Siskiyou*	67	28	49.4	0.53
Utah.				
Moab	84	25	55.7	0.29
Vermont.				
Burlington (2)	.....	.....	.....	1.93
Wisconsin.				
Delevan	76	26	45.6	2.30
Grantsburgh	75	6	42.7	0.46
Horicon	.....	4	42.2	0.69
Mexico.				
Guanajuato	84	45	68.7	0.56
Colony Surinam, S.A.				
Burnside-Coronie	88	72	78.9	11.44
Sandwich Islands.				
Honolulu	83	62	72.9	5.25

Letters of the alphabet denote the number of days missing from the record, thus: the letter *c* indicates three days missing in a thirty-one day month, etc., etc.

*Extremes of temperature from observed readings. †Signal Service instruments. ‡One observation daily at 10 a. m. §Probably 24°.

Corrections: Hanover (2), N. H., for mean temperature, February, 1890, 25.0, read 25.3. Under "Maximum rainfalls in one hour or less," April, 1890, New Orleans, La., 0.25 inch in five minutes should be 0.28 inch.

Mean temperature (degrees Fahr.) observed at Taunton, Mass., by A. F. Sprague, voluntary observer.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
1871	.....	30.8	43.7	49.0	59.0	67.7	73.5	72.6	59.7	54.3	36.3	27.0	.....
1872	28.2	27.8	26.3	47.0	59.8	72.0	77.1	75.9	58.9	53.0	40.4	22.5	49.1
1873	24.4	25.3	33.1	46.3	57.0	67.5	75.1	70.6	61.3	48.4	31.5	31.3	47.6
1874	29.5	24.4	32.1	36.7	53.7	67.6	71.2	66.0	62.6	51.3	38.8	27.9	46.8
1875	17.4	19.5	25.2	40.0	55.7	65.8	74.5	73.5	64.0	53.0	37.7	30.4	46.4
1876	33.3	29.4	36.1	47.5	59.3	71.0	80.1	75.1	64.7	51.0	46.0	22.8	51.4
1877	23.0	32.0	36.4	45.0	58.5	71.1	75.9	78.2	68.5	54.2	44.2	33.0	51.7
1878	28.2	30.2	41.8	54.0	60.2	68.0	80.5	73.6	69.0	59.3	41.3	33.0	53.3
1879	24.5	26.1	37.3	45.7	63.0	69.9	74.8	73.6	65.0	60.2	41.5	36.6	51.4
1880	37.6	34.0	37.7	49.6	67.1	72.6	77.7	74.0	68.0	54.6	40.6	28.5	53.5
1881	24.3	29.4	40.7	47.2	62.1	65.5	73.3	76.6	70.5	57.1	44.6	40.5	52.6
1882	28.2	32.6	39.5	47.3	53.4	70.5	77.6	74.8	62.3	58.2	40.9	30.0	51.3
1883	25.0	29.6	30.6	47.0	60.0	73.5	75.4	71.3	63.5	54.7	45.0	31.3	50.6
1884	24.4	35.4	37.6	47.4	56.8	68.6	72.1	71.2	66.2	53.4	42.0	34.0	50.8
1885	28.2	20.2	27.7	46.8	55.0	67.3	73.4	68.8	59.0	52.1	45.8	32.8	48.1
1886	25.8	28.6	34.6	49.7	57.5	63.7	70.8	67.8	62.7	50.9	39.2	27.9	47.3
1887	25.4	30.4	32.1	44.6	60.9	65.1	75.4	67.2	58.7	51.3	40.8	32.2	48.7
1888	19.4	28.4	32.4	43.1	54.3	66.8	67.4	69.8	57.7	45.0	42.8	32.8	46.7
1889	33.4	25.1	36.7	47.2	59.5	66.4	69.1	66.9	62.4	48.2	43.6	36.8	49.6
1890	33.7	34.9	34.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean..	27.0	28.7	34.8	46.4	58.6	68.5	74.5	72.0	63.4	53.2	41.2	31.1	49.8

Precipitation (inches and hundredths) observed at Taunton, Mass., by A. F. Sprague, voluntary observer.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
1874 ...	.....	.....	.....	.....	.....	2.08	2.85	9.07	1.84	1.54	1.95	2.31	.....
1875 ...	7.64	4.21	3.75	5.40	2.90	2.48	3.37	4.63	1.69	2.62	2.96	1.67	43.32
1876 ...	5.06	4.68	3.39	3.88	1.91	1.82	5.57	2.44	4.59	0.44	7.00	2.87	43.65
1877 ...	4.86	2.68	3.00	1.56	2.50	2.61	2.80	5.79	0.82	8.38	6.88	3.84	45.78
1878 ...	5.16	4.04	3.19	5.32	1.63	2.54	2.07	1.38	1.05	4.42	7.91	3.84	42.55
1879 ...	3.87	5.41	4.60	4.77	1.25	2.92	4.86	4.25	2.07	0.32	3.71	4.20	42.23
1880 ...	4.91	5.09	3.86	3.75	0.25	1.51	7.03	10.39	2.02	2.74	4.60	3.25	49.40
1881 ...	6.10	3.76	4.48	3.24	3.56	5.40	1.53	0.25	2.36	1.69	6.53	3.10	41.00
1882 ...	6.38	5.51	2.00	2.10	3.36	2.28	1.16	0.20	6.13	3.07	2.09	2.98	37.26
1883 ...	6.20	4.18	3.16	1.55	2.70	1.00	2.10	0.14	2.13	3.15	5.08	3.27	34.66
1884 ...	5.52	5.62	5.33	4.92	3.22	4.08	4.70	5.16	0.58	2.65	3.64	5.85	51.27
1885 ...	5.41	2.54	1.31	2.89	4.38	2.97	2.33	3.56	1.01	3.70	3.46	2.33	35.89
1886 ...	5.44	8.75	3.78	2.40	4.32	1.29	2.84	3.79	2.73	3.45	4.20	6.40	49.45
1887 ...	7.34	4.80	5.63	5.17	2.40	2.98	6.65	5.31	1.68	3.12	2.36	4.54	51.98
1888 ...	4.67	3.32	0.74	2.35	4.95	1.63	3.42	5.09	9.11	4.90	9.66	3.99	59.83
1889 ...	6.33	2.14	2.65	4.75	5.10	2.08	9.68	7.74	3.69	4.30	6.77	2.69	58.01
1890 ...	3.26	3.80	8.77	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean..	5.51	4.41	4.11	3.60	2.90	2.48	3.91	4.32	2.72	3.16	4.92	3.57	45.64

Mean temperature (degrees Fahr.) observed at Santa Fé, N. Mex., by assistant surgeons, U. S. Army, and Signal Service observers.

1849 ...	32.9	35.1	43.2	53.0	54.7	71.3	.....	70.2	64.4	48.9	39.6	33.5	.....
1850 ...	30.2	31.9	40.9	50.7	.....	.....	76.2	75.2	.....	55.8	.....	23.2	.....
1851 ...	34.0	34.2	.....	49.4	59.0	69.4	72.9	.....	.....	.....	.....	.....	.....
1852 ...	.....	.....	.....	.....	.....	.....	.....	.....	59.6	47.9	34.4	29.6	.....
1853 ...	31.2	28.0	37.9	53.9	60.3	66.4	69.4	66.7	62.7	48.3	40.3	31.4	49.7
1854 ...	28.5	34.1	41.5	49.8	54.2	68.2	71.8	67.7	61.0	55.6	40.0	33.3	50.5
1855 ...	31.9	36.3	40.1	50.6	59.6	68.7	73.0	70.0	63.6	54.8	35.1	26.6	50.8
1856 ...	24.2	29.7	40.1	50.0	58.9	73.6	74.3	71.9	64.4	51.3	34.9	21.0	49.5
1857 ...	25.5	29.8	46.6	49.8	57.5	68.7	71.5	68.8	60.3	49.9	37.6	29.3	50.4
1858 ...	35.0	33.5	40.0	48.1	57.6	66.4	69.2	66.0	63.0	49.3	34.4	34.1	49.1
1859 ...	23.9	32.6	35.5	43.6	58.2	70.3	69.3	66.9	57.9	50.6	38.1	33.5	47.7
1860 ...	29.3	29.3	43.1	47.4	58.7	65.8	70.3	68.6	68.7	57.7	37.8	32.6	50.7
1861 ...	21.0	32.4	43.2	53.0	62.1	72.2	74.6	71.3	66.7	52.8	42.5	38.2	52.5
1862 ...	34.8	30.6	.....	.....	.....	.....	.....	.....	63.0	54.0	40.7	32.5	.....
1863 ...	27.1	32.7	45.7	53.9	54.9	69.9	73.7	70.6	67.1	53.3	37.2	26.6	51.1
1864 ...	24.9	35.5	36.4	49.2	60.0	66.1	69.3	71.9	66.6	48.7	36.3	33.9	49.9
1865 ...	26.9	32.8	38.4	46.7	66.6	70.1	69.6	70.1	64.5	48.1	38.6	20.3	49.4
1866 ...	28.5	33.9	.....	.....	.....	.....	.....	.....	61.6	.....	.....	.....	.....
1867 ...	.....	.....	.....	.....	.....	.....	.....	.....	66.7	55.7	42.5	41.1	.....
1868 ...	26.8	34.0	42.0	50.3	56.8	70.9	70.4	66.0	61.3	50.3	34.0	29.8	49.4
1869 ...	22.7	26.9	40.4	43.0	56.6	67.3	73.1	72.6	64.8	48.9	41.6	24.6	48.5
1870 ...	26.4	39.0	37.4	50.9	66.6	70.1	73.7	71.3	65.9	52.1	44.2	27.8	52.8
1871 ...	35.2	35.3	43.6	50.0	64.1	76.6	76.7	74.5	69.2	56.6	44.6	39.6	55.5
1872 ...	30.3	34.0	42.0	48.9	61.6	69.5	70.5	68.9	62.6	54.2	29.6	[30.3]	[50.2]
1873 ...	31.0	.....	.....	.....	.....	72.0	75.4	.....	.....	.....	.....	.....	.....
1874 ...	31.7	27.9	36.0	41.1	56.3	67.6	69.5	67.6	58.3	51.0	38.7	29.7	48.0
1875 ...	28.1	31.2	33.4	45.9	58.1	67.5	64.0	65.3	57.6	52.8	33.8	32.9	48.0
1876 ...	29.2	33.0	36.4	48.7	54.4	63.9	67.3	64.3	59.0	48.3	36.3	29.1	47.5
1877 ...	32.0	33.8	44.3	41.3	52.5	64.4	66.5	66.1	60.0	47.1	34.3	29.3	47.6
1878 ...	22.1	30.4	40.1	46.6	55.2	62.2	70.3	68.2	58.0	50.9	39.2	26.4	47.5
1879 ...	29.2	37.0	47.5	48.0	60.0	65.2	70.0	68.0	62.5	49.8	36.9	28.1	50.2
1880 ...	29.2	24.2	32.4	44.0	56.1	65.4	67.4	64.5	56.8	45.7	29.6	29.4	45.4
1881 ...	23.7	33.6	36.7	51.2	57.2	68.6	68.6	65.5	58.8	49.8	33.6	[35.0]	[48.5]
1882 ...	29.3	32.5	41.4	46.1	53.6	63.6	67.9	64.8	58.5	50.1	39.8	32.2	48.3
1883 ...	26.8	36.1	43.9	44.9	54.6	.....	.....	.....	.....	.....	.....	.....	.....
1884 ...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30.9	.....
1885 ...	24.0	32.2	40.2	45.8	52.5	61.6	67.9	66.3	59.7	49.6	40.0	32.4	47.7
1886 ...	25.2	33.3	35.0	43.7	59.7	63.6	70.6	65.3	57.4	49.6	33.7	34.0	47.6
1887 ...	29.9	33.9	43.0	46.8	55.3	65.6	67.0	65.8	61.1	50.6	41.9	26.8	49.0
1888 ...	30.3	35.5	37.4	49.9	53.4	67.1	70.2	65.8	63.0	51.0	37.6	33.3	49.5
1889 ...	24.6	29.6	41.6	51.6	56.4	64.2	70.5	70.9	61.0	52.1	35.2	39.8	48.1
Mean..	28.4	32.6	40.2	48.5	57.2	67.8	70.7	68.5	62.1	51.2	37.6	30.3	49.6

Table showing for Washington City the average departure of the mean hourly atmospheric pressure, in any month of the year, from the mean of the twenty-four hours for the same period.

1 a. m.	.008	.003	.007	.009	—.002	—.001	.010	—.001	.006	—.001	—.010	.004	.003
2 a. m.	.005	.001	.000	.006	—.003	—.006	.002	—.006	.000	—.003	—.010	.004	—.001
3 a. m.	.003	—.004	—.004	.004	—.003	—.005	—.003	—.007	—.002	—.006	—.012	.000	—.003
4 a. m.	.002	—.010	—.006	.000	—.001	—.002	—.003	—.005	—.002	—.006	—.014	.003	—.003
5 a. m.	—.004	—.010	—.002	.010	.006	.002	.006	.002	.004	.003	—.011	.000	.001
6 a. m.	—.002	—.004	.006	.021	.017	.014	.014	.012	.012	.010	—.001	.004	.009
7 a. m.	.008	.006	.016	.031	.027	.021	.018	.020	.022	.018	.009	.014	.018
8 a. m.	.016	.016	.026	.036	.031	.028	.024	.027	.024	.034	.020	.022	.026
9 a. m.	.024	.022	.030	.035	.034	.030	.027	.026	.032	.038	.028	.031	.030
10 a. m.	.032	.024	.036	.035	.031	.030	.026	.026	.028	.034	.029	.030	.030
11 a. m.	.030	.024	.023	.027	.026	.026	.020	.023	.026	.020	.020	.030	.025
Noon..	.012	.015	.009	.014	.015	.020	.017	.010	.014	.008	.002	.006	.012
1 p. m.	—.014	—.004	—.014	.000	.001	.007	.003	—.002	—.002	—.012	—.016	—.016	—.006
2 p. m.	—.028	—.019	—.032	—.016	—.012	—.006	—.013	—.012	—.012	—.023	—.028	—.028	—.019
3 p. m.	—.031	—.026	—.041	—.030	—.026	—.018	—.023	—.023	—.023	—.029	—.028	—.032	—.028
4 p. m.	—.032	—.028	—.042	—.036	—.034	—.028	—.034	—.028	—.028	—.032	—.026	—.030	—.032
5 p. m.	—.025	—.028	—.037	—.038	—.036	—.034	—.037	—.028	—.028	—.028	—.019	—.023	—.030
6 p. m.	—.014	—.020	—.024	—.040	—.036	—.032	—.032	—.028	—.028	—.021	—.010	—.018	—.026
7 p. m.	—.010	—.011	—.014	—.032	—.028	—.026	—.024	—.020	—.020	—.013	—.002	—.007	—.017
8 p. m.	.000	—.006	.000	—.022	—.018	—.020	—.018	—.007	—.007	—.008	—.006	—.005	—.009
9 p. m.	.002	—.005	.010	—.010	—.004	—.006	.000	.001	.001	.000	.012	—.003	.000
10 p. m.	.006	.000	.016	—.004	.004	—.001	.005	.003	.003	.004	.018	.000	.005
11 p. m.	.006	.002	.018	.000	.006	.004	.005	.004	.004	.001	.020	.002	.006
M'dn't.	.005	.000	.013	.000	.004	.006	.005	.006	.008	.002	.024	.005	.007
Range.	.064	.052	.072	.076	.072	.064	.065	.055	.060	.070	.057	.068	.062

The averages were deduced from hourly observations taken as follows: Eye readings from May, 1887, to June, 1888, inclusive; Richards' barograph readings, checked twice daily by comparison with a standard mercurial barometer from August, 1889, to May, 1890, inclusive. Plus departures are given without sign.

Precipitation (inches and hundredths) observed at Fort Brady, Mich., by assistant surgeons, U. S. Army.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
1836 ...	.....	.....	.....	.....	.....	.....	5.51	2.36	6.30	2.98	4.67	3.24	.....
1837 ...	1.05	1.15	2.19	1.32	3.68	3.66	4.62	5.15	4.97	4.13	3.11	1.89	36.92
1838 ...	2.64	0.32	1.18	2.55	2.48	2.52	2.84	6.37	4.49	3.70	4.40	0.88	34.37
1839 ...	1.73	0.54	1.89	0.43	0.47	4.07	1.53	2.33	4.29	4.25	1.78	0.70	24.01
1840 ...	1.73	2.19	0.32	2.73	1.15	2.16	2.95	4.63	5.46	3.57	3.67	2.53	33.09
1841 ...	1.60	0.93	[1.37]	1.04	1.99	2.13	2.41	1.05	4.40	1.10	3.79	2.30	[24.11
1842 ...	2.51	1.47	1.43	1.33	1.42	3.77	2.81	1.06	3.50	2.56	3.38	1.16	26.40
1843 ...	2.07	1.06	0.68	1.45	2.42	3.14	2.53	0.41	3.00	5.72	3.19	1.58	27.25
1844 ...	1.96	0.43	1.66	3.07	2.87	4.26	2.24	4.98	4.81	2.18	3.50	2.49	34.45
1845 ...	1.66	1.88	2.20	2.26	2.19	1.43	4.36	3.94	2.64	3.95	1.87	1.28	29.76
1846 ...	1.01	0.94	2.51	2.65	2.03	0.95	[2.98]	[2.76]	4.13	3.90	2.65	2.00	[28.51
1847 ...	1.50	0.80	1.00	2.00	3.00	3.35	3.79	3.83	5.71	1.20	2.62	2.83	31.63
1848 ...	1.92	1.83	0.97	1.30	4.14	.....	.....	.....	.....	.....	.....	.....	.....
1850 ...	1.83	0.85	1.83	2.15	0.70	2.92	8.15	4.09	4.90	4.00	1.35	2.91	35.66
1851 ...	2.74	1.28	0.84	2.23	3.11	2.91	5.99	3.67	4.82	4.04	6.12	7.55	45.30
1852 ...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.11	1.42	2.99	.....
1853 ...	0.92	1.19	0.48	0.73	0.74	3.94	3.27	3.19	2.61	2.16	1.77	0.74	21.74
1854 ...	2.49	1.18	1.34	2.14	3.61	1.23	3.21	3.86	3.18	3.40	3.07	0.45	29.16
1855 ...	2.13	0.65	1.03	1.07	0.00	1.10	.....	2.56	3.49	0.80	1.16	1.68	22.80
1856 ...	0.24	0.21	0.45	0.74	0.55	2.47	1.11	2.49	8.36	[3.48]	[2.50]	[2.10]	[24.70
1867 ...	.....	1.58	1.22	1.11	.....	.....	4.32	3.16	.....	.....	.....	.....	.....
1870 ...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.80	.....
1871 ...	.....	.....	2.54	1.78	0.72	.....	.....	.....	.....	.....	.....	.....	.....
1872 ...	.....	.....	.....	.....	.....	.....	2.06	1.62	6.28	.....	1.30?	.....	.....
1873 ...	[1.74]	[1.26]	[1.22]	0.82	2.24	2.76	2.50	1.72	6.88	3.74	0.92	2.32	[28.12
1874 ...	2.76	1.30	1.32	0.68	2.14	3.58	1.76	1.25	3.94	4.94	2.56	1.68	27.91
1875 ...	1.06	1.28	1.26	2.16	2.74	2.84	1.12	2.48	3.70	5.28	2.84	2.90	29.66
1876 ...	3.68	1.30	2.12	2.32	2.14	8.42	4.66	2.20	0.52	2.72	2.29	1.04	32.41
1877 ...	0.98	0.28	0.59	0.50	0.78	4.60	1.76	2.57	4.23	6.55	1.62	2.63	27.09
1878 ...	0.14	0.80	0.12	2.81	3.15	2.36	0.43	1.19	6.71	5.50	0.23	1.75	25.19
1879 ...	0.63	1.43	1.08	0.30	[3.72]	3.25	0.96	2.35	3.98	1.98	2.12	2.01	[23.81
1880 ...	2.40	1.56	1.06	2.19	3.75	4.32	2.38	3.63	3.66	2.67	1.42	1.64	30.68
1881 ...	1.00	1.27	0.57	0.71	3.04	2.01	1.03	0.41	8.53	3.04	2.38	0.93	24.92
1882 ...	0.83	2.91	1.06	1.60	1.67	3.34	2.37	4.10	5.87	3.67	1.51	1.50	31.03
1883 ...	1.40	1.15	0.30	1.69	4.29	4.43	6.02	2.11	1.93	3.21	3.04	1.63	31.20
1884 ...	0.73	1.22	0.69	1.27	2.73	1.43	3.14	4.29	7.00	4.35	1.25	3.32	31.42
1885 ...	1.75	0.64	1.44	0.53	1.75	2.66	2.61	2.24	3.14	2.45	3.60	4.72	27.53
1886 ...	4.04	4.04	1.78	2.04	1.92	3.12	1.50	1.42	3.26	5.69	1.44	1.04	31.29
1887 ...	2.74	1.20	0.69	2.87	1.07	3.02	4.18	0.54	1.86	4.07	1.52	0.40	23.16
1888 ...	1.98	1.26	1.93	1.60	3.22	1.93	0.93	3.30	3.56	2.32	3.31	2.34	27.68
1889 ...	2.19	2.12	0.31	1.47	2.45	5.98	3.10	2.77	4.93	1.74	3.27	2.78	33.11
Mean..	1.74	1.26	1.22	1.61	2.22	3.09	2.98	2.76	4.47	3.48	2.50	2.10	29.43

Rainfall and melted snow for 43 years at Miami, Saline Co., Mo., observations made by Judge J. J. Ferril, and furnished to Missouri State Board of Agriculture by Robert Ruxton.

1847 ...	1.12	1.68	1.01	3.63	6.16	2.72	2.23	0.86	1.89	3.40	2.94	1.01	28.65
1848 ...	0.87	1.87	2.07	2.01	5.49	2.09	1.78	4.53	2.72	3.47	0.89	2.71	30.50
1849 ...	2.82	0.29	2.63	3.78	3.41	5.75	3.90	0.26	4.20	4.01	3.72	0.73	41.50
1850 ...	1.70	1.64	1.75	3.63	1.97	5.82	0.43	3.74	3.19	3.40	2.97	1.62	37.86
1851 ...	0.41	1.50	1.07	0.93	6.00	10.98	6.16	5.78	2.12	2.24	5.50	2.94	45.63
1852 ...	1.74	0.23	2.35	4.03	4.19	5.44	5.00	3.29	2.32	5.39	3.21	1.03	38.22
1853 ...	1.13	0.72	1.22	2.50	2.87	5.72	1.75	2.66	1.07	0.72	1.72	1.00	23.08
1854 ...	0.13	1.66	2.81	3.34	3.84	3.63	0.16	0.54	1.07	2.96	0.64	0.40	21.18
1855 ...	2.72	0.60	1.69	1.07	6.82	4.65	4.25	8.26	2.97	2.07	2.08	3.46	40.64
1856 ...	1.21	1.18	1.00	3.89	2.53	1.02	2.60	6.97	2.22	2.13	2.00	3.57	30.32
1857 ...	0.63	4.44	0.97	0.53	1.44	2.13	0.25	4.53	1.60	2.22	2.78	0.93	22.45
1858 ...	1.16	1.17	2.83	2.53	4.56	7.00	5.78	3.16	2.87	3.19	3.35	1.78	39.38
1859 ...	1.69	1.70	3.69	2.47	7.47	2.31	5.88	4.27	2.47	0.35	1.19	0.25	33.74
1860 ...	1.13	1.82	0.25	0.12	1.66	2.59	0.31	1.10	2.34	0.66	0.94	2.81	15.73
1861 ...	1.35	3.05	2.52	4.78	5.09	9.73	3.02	2.15	4.15	4.65	0.50	1.30	42.29
1862 ...	3.70	0.52	2.48	3.40	2.74	2.05	3.70	1.71	4.27	3.62	2.65	4.12	34.96
1863 ...	3.85	3.45	0.85	0.74	3.65	2.90	1.92	4.17	0.75	3.92	0.47	2.80	29.47
1864 ...	1.87	0.07	0 60	4.90	1.00	1.65	2.04	1.44	2.75	3.14	2.32	4.08	25.86
1865 ...	0.35	2.40	3.62	2.55	1.33	9.48	8.72	5.20	6.22	1.60	0.22	0.50	42.19
1866 ...	3.00	1.15	1.83	3.05	1.90	1.80	5.10	0.83	9.29	3.10	1.00	1.42	33.57
1867 ...	1.05	1.93	1.34	1.50	3.79	2.83	3.31	2.70	0.60	1.00	1.05	0.60	21.70
1868 ...	0.77	0.64	4.07	4.37	3.95	4.03	2.11	2.70	5.00	1.92	4.70	2.10	36.36
1869 ...	2.65	1.22	1.80	2.40	5.00	7.52	5.65	4.29	3.83	3.05	1.80	2.60	41.81
1870 ...	0.75	0.00	1.90	1.00	2.65	1.80	1.17	9.80	4.11	3.25	0.45	0.58	27.46
1871 ...	2.15	1.27	3.00	1.60	3.42	1.95	3.15	2.66	0.45	5.20	0.90	1.80	27.55
1872 ...	0.05	0.90	3.73	3.89	5.25	2.35	8.25	6.35	4.17	1.40	0.13	1.80	38.27
1873 ...	4.97	0.80	2.11	5.50	2.53	2.61	3.16	3.03	5.00	1.85	1.65	5.70	38.91
1874 ...	2.08	0.86	2.57	3.44	2.97	1.63	1.35	1.38	3.75	1.75	2.45	1.80	26.03
1875 ...	0.22	1.62	1.10	2.73	3.15	8.30	8.79	1.63	2.25	0.93	0.41	3.00	34.13
1876 ...	2.15	0.32	5.30	5.24	3.67	9.64	4.86	4.20	3.05	1.90	1.43	0.27	42.03
1877 ...	1.22	0.42	4.24	2.15	6.28	7.21	2.36	2.92	2.77	8.53	2.42	3.46	43.98
1878 ...	1.20	4.50	4.22	3.59	5.61	3.61	2.77	3.75	2.85	2.25	1.83	4.13	40.31
1879 ...	1.56	0.74	0.91	3.94	2.10	11.10	7.40	1.74	3.98	3.67	2.63	2.30	42.07
1880 ...	1.48	1.90	1.87	1.71	5.45	1.31	2.84	6.81	3.67	2.74	2.23	0.89	32.90
1881 ...	0.23	4.49	4.05	3.25	4.78	6.07	1.21	0.74	4.99	4.59	2.86	2.38	39.64
1882 ...	0.88	2.59	5.83	3.44	4.36	5.40	5.92	2.13	2.85	4.07	3.34	1.59	41.00
1883 ...	2.07	4.93	1.67	0.58	6.34	10.29	8.82	1.33	1.37	5.20	2.40	0.90	45.90
1884 ...	1.05	1.80	3.22	3.36	3.16	4.02	14.81	6.07	10.91	4.45	1.85	3.73	58.43
1885 ...	2.49	1.17	0.37	0.82	3.96	6.29	3.25	5.24	5.69	4.50	1.48	1.46	42.72
1886 ...	2.60	1.85	1.73	3.55	2.60	7.64	0.19	2.76	4.54	1.59	1.59	0.66	31.29
1887 ...	1.58	3.57	1.10	3.68	2.97	5.47	4.29	1.83	6.20	2.75	1.58	0.75	35.77
1888 ...	2.28	2.74	7.51	1.66	5.03	11.51	4.90	9.51	0.57	3.35	3.59	2.20	54.85
1889 ...	1.73	2.46	0.97	2.29	10.24	6.66	6.22	1.42	5.92	3.80	5.10	0.51	47.38
Mean..	1.62	1.72	2.32	2.92	4.03	5.09	4.13	3.64	3.47	3.04	2.07	1.95	35.99

NOTE.—Snowfalls of 10 inches or more: March 2, 1850, 11.0; January 17, 1852, 13.0; January 21, 1855, 16.0; January 25-27, 1856, 10.0; January 20, 1863, 13.0; January 4, 1873, 13.0; January 22, 23, 1873, 12.0; December 12, 13, 1878, 20.0; February 11, 12, 1881, 12.0; March 10-13, 1881, 11.0; January 14, 15, 16, 1883, 10.0.

Table of miscellaneous meteorological data for May, 1890—Signal Service observations.

Stations and districts.	Elevation above sea-level, feet.	Pressure, in inches.			Temperature of air, in degrees Fahrenheit.								Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal precipitation.	Wind.					Cloudless days.	Partly cloudy days.	Cloudy days.	Days with rainfall.	Average cloudiness, tenths.		Precipitat'n data since opening of station.				
		Mean actual.	Mean reduced.	Monthly range.	Monthly mean.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Greatest daily range.	Least daily range.					Total movement, miles.	Prevailing direction.	Maximum velocity: Miles per hour.	Maximum velocity: Direction.	Maximum velocity: Date.					8 a. m.	8 p. m.	Length of record, years.	Greatest for month.	Year.	Least for month.	Year.
New England.					**53.9**	**+ 0.2**									**4.67**	**+ 1.13**																
Eastport	53	29.91	29.97	0.77	47.9	+ 0.9	65	53.8	35	42.0	22	4	40.4	80.4	6.19	+ 1.95	7,287	s.	38	e.	28	7	8	16	17	5.7	4.1	18	13.22	1881	2.29	1889
Portland	99	29.84	29.94	0.77	52.1	− 1.9	75	58.9	36	45.3	30	5	46.3	85.4	6.10	+ 2.95	6,760	s.	37	se.	20	8	10	13	17	4.8	5.9	20	6.46	1884	0.88	1879
Manchester	247	29.70	29.96	0.73	57.0	......	80	67.7	35	46.2	34	7	45.0	69.7	4.54	......	4,361	nw.	23	s.	20	7	14	10	15	5.4	6.3	4	4.54	1890	2.20	1887
Northfield	872	29.02	29.95	0.75	51.8	......	73	62.0	24	41.7	37	3	43.9	72.2	4.32	......	7,240	s.	48	sw.	17	3	12	16	18	6.4	5.7	4	4.32	1890	1.39	1887
Boston †	125	29.85	29.98	0.72	57.0	+ 1.0	80	65.2	39	48.9	28	5	47.4	74.0	4.46	+ 1.22	8,643	s.	42	s.	20	9	11	11	15	5.9	6.0	20	6.05	1882	0.97	1879
Nantucket	14	29.99	30.00	0.64	51.9	......	67	56.9	36	46.9	18	4	47.6	82.7	2.48	......	9,411	sw.	60	ne.	29	7	9	15	12	4.8	5.6	4	7.87	1888	1.75	1887
Wood's Holl	22	29.97	29.99	0.67	52.6	......	66	57.2	42	48.0	18	2	49.6	89.8	2.72	− 0.24	11,164	sw.	45	sw.	*	9	11	11	14	4.6	6.2	13	5.59	1888	0.88	1880
Vineyard Haven	......	......	......	....	56.4	......	75	64.2	37	48.6	27	7	......	....	2.86	......	......	se.	....	......	...	9	9	13	11	...	...	4	4.45	1889	1.72	1887
Block Island	26	29.97	30.00	0.67	52.2	+ 0.2	66	56.6	42	47.8	14	4	49.2	89.9	3.83	− 0.25	10,923	sw.	43	ne.	28	10	8	13	13	3.6	4.5	10	6.39	1884	0.51	1887
Narragansett Pier	22	......	......	....	55.1	+ 1.1	78	63.6	38	46.6	27	7	......	....	5.30	+ 1.65	......	sw.	....	......	...	8	16	7	15	...	...	9	7.29	1888	1.05	1887
New Haven	107	29.87	29.99	0.70	56.8	− 0.2	79	65.2	38	48.5	30	7	49.2	79.8	4.24	+ 0.76	4,883	s.	30	s.	20	9	12	10	14	5.7	5.8	18	6.27	1873	0.18	1887
New London	47	29.92	29.97	0.68	56.3	+ 0.3	77	62.6	42	50.0	22	5	48.4	77.2	4.51	+ 1.00	6,224	s.	30	s.	20	5	13	13	14	4.8	5.5	20	5.73	1883	0.98	1878
Mid. Atlantic States.					**62.8**	**− 0.4**									**4.31**	**+ 1.06**																
Albany	85	29.87	29.96	0.76	57.1	− 2.9	78	66.8	34	47.4	31	5	49.0	75.4	5.19	+ 2.32	6,340	*	33	se.	13	3	14	14	15	6.5	6.0	17	5.19	1890	0.89	1879
New York City	185	29.79	29.99	0.70	60.6	+ 0.6	80	69.1	42	52.2	26	8	49.1	73.2	3.11	+ 0.08	7,646	se.	36	w.	28	5	14	12	15	4.6	5.9	20	6.53	1886	0.73	1877
Harrisburg	377	29.57	29.98	0.68	60.8	......	79	70.0	38	51.6	30	9	48.2	66.8	6.61	......	4,980	e.	36	sw.	14	6	13	12	17	6.4	5.9	2	9.51	1889	6.61	1890
Philadelphia	117	29.87	29.99	0.70	62.8	− 0.2	84	72.1	39	53.4	29	9	50.0	69.2	2.96	+ 0.23	7,786	nw.	45	nw.	1	7	13	11	16	5.8	6.2	19	5.83	1873	0.54	1880
Atlantic City	53	29.94	29.99	0.64	57.0	0.0	76	61.6	44	52.4	17	5	51.8	84.3	5.81	+ 3.24	8,708	sw.	36	nw.	1	13	5	13	14	4.4	4.2	17	5.81	1890	0.54	1880
Baltimore	76	29.89	29.98	0.67	64.0	− 1.0	87	72.4	43	55.5	29	6	51.6	68.6	5.98	+ 2.75	3,970	s.	24	nw.	20	7	13	11	18	5.8	5.5	20	7.07	1886	1.22	1883
Washington City	112	29.86	29.98	0.66	63.8	− 1.2	86	73.1	42	54.6	31	7	53.0	72.8	4.73	+ 1.25	4,773	s.	32	nw.	1	4	14	13	16	6.1	5.5	20	10.69	1889	1.01	1875
Cape Henry	......	......	......	....	66.3	+ 1.3	88	73.6	49	59.0	25	5	......	....	2.27	− 1.63	......	*	....	......	...	11	12	8	9	...	...	17	8.17	1888	0.18	1880
Lynchburgh	685	29.26	29.99	0.61	66.3	− 0.7	88	77.1	38	55.5	36	9	53.6	69.2	4.71	+ 1.25	3,149	s.	45	nw.	1	9	16	6	17	5.3	5.7	19	9.42	1873	1.19	1883
Norfolk	43	29.95	29.99	0.62	67.4	+ 0.4	86	75.6	47	59.1	29	5	58.4	77.3	4.03	+ 0.02	7,005	s.	34	s.	14	5	20	6	15	6.1	4.9	20	8.46	1888	0.54	1880
S. Atlantic States.					**71.5**	**+ 0.9**									**5.22**	**+ 1.35**																
Charlotte	808	29.16	30.00	0.58	69.8	+ 0.8	90	80.6	42	58.9	32	9	56.4	68.6	7.07	+ 2.71	3,849	sw.	24	s.	19	18	8	5	13	4.3	3.7	12	11.04	1886	1.15	1880
Hatteras	11	30.00	30.02	0.56	68.8	+ 2.8	80	73.6	53	63.9	19	6	63.0	83.4	4.78	+ 0.60	9,823	s.	38	nw.	8	13	14	4	12	4.8	3.5	16	7.81	1883	1.02	1882
Raleigh	388	29.58	30.00	0.62	69.4	......	92	80.2	44	58.5	31	8	56.8	70.6	4.16	......	4,074	sw.	24	n.	1	13	12	6	12	4.4	5.1	4	6.07	1888	3.46	1887
Southport	......	......	......	....	71.4	+ 1.4	84	77.7	48	65.1	24	7	......	....	4.75	+ 1.64	......	sw.	....	......	...	10	15	6	8	...	...	15	6.10	1885	1.17	1882
Wilmington	52	29.95	30.01	0.59	70.8	+ 0.8	90	79.1	50	62.6	26	5	62.8	80.0	5.26	+ 0.95	5,540	sw.	29	sw.	6	8	15	8	6	5.0	4.1	20	8.63	1873	1.18	1886
Charleston	52	29.96	30.01	0.52	73.0	0.0	86	79.6	51	66.4	21	6	65.7	81.2	3.67	− 0.58	5,738	sw.	27	s.	19	13	8	10	16	5.3	4.2	20	8.62	1883	0.48	1881
Columbia	......	......	......	....	71.6	......	91	82.2	45	61.1	29	10	......	....	4.17	......	......	s.	....	......	...	9	14	8	13	...	...	3	6.66	1888	0.95	1889
Augusta	183	29.83	30.02	0.57	72.9	− 0.1	92	83.9	45	61.9	33	10	59.6	69.2	5.28	+ 1.82	2,552	s.	30	s.	14	15	9	7	11	4.3	4.9	20	8.63	1873	0.84	1879
Savannah	87	29.93	30.02	0.49	73.0	− 1.0	89	81.0	51	64.9	23	7	62.5	75.2	3.13	+ 0.07	5,443	sw.	35	sw.	5	11	10	10	12	4.6	4.8	20	5.22	*	0.35	1889
Jacksonville	43	29.97	30.02	0.47	74.4	− 0.6	89	83.2	53	65.5	27	5	63.5	74.0	9.20	+ 4.84	5,960	s.	31	sw.	4	15	7	9	16	3.8	4.4	19	9.20	1890	0.51	1889
Florida Peninsula.																																
Jupiter	28	30.00	30.03	0.43	76.0	......	88	81.9	62	70.0	17	5	70.2	81.6	13.51	......	6,128	*	32	se.	29	0	16	15	16	5.8	5.4	3	13.51	1890	3.45	1889
Key West	22	30.00	30.02	0.39	78.8	− 1.2	87	83.0	69	74.6	13	5	71.3	78.8	3.84	+ 0.24	6,467	se.	29	nw.	7	11	11	9	12	5.9	4.9	20	7.84	1880	0.11	1886
Micco	......	......	......	....	76.0	......	96	86.5	56	65.6	33	8	......	....	10.19	......	......	*	....	......	...	9	10	9	12	...	...	2	10.19	1890	0.73	1889
Tampa	36	29.98	30.02	0.48	76.5	......	90	85.7	58	67.3	28	5	68.0	77.4	4.49	......	4,191	ne.	29	e.	19	5	12	14	15	5.3	4.6	1	......	......	......	....
Titusville	44	29.99	30.03	0.49	74.8	......	91	82.1	56	67.6	24	6	69.2	84.8	15.14	......	8,120	s.	38	se.	26	9	8	14	20	5.0	4.6	3	15.14	1890	0.79	1889
Eastern Gulf States.					**72.1**	**− 1.2**									**6.34**	**+ 1.90**																
Atlanta	1,139	28.82	30.00	0.55	69.0	0.0	89	78.8	40	59.1	28	3	54.4	65.6	6.32	+ 2.60	5,425	nw.	32	nw.	7	6	23	2	12	4.5	4.4	12	6.86	1888	1.27	1881
Pensacola	56	29.92	29.98	0.52	72.8	− 1.2	83	79.2	55	66.4	20	5	65.9	79.8	3.14	− 0.60	7,592	sw.	40	sw.	5	9	12	10	12	4.2	5.2	11	7.47	1883	0.75	1886
Auburn	......	......	......	....	71.2	......	88	81.2	43	61.2	27	6	......	....	6.18	......	......	se.	....	......	...	17	6	8	9	...	...	3	6.54	1888	1.52	1889
Mobile	35	29.96	30.00	0.52	72.7	− 1.3	87	81.1	54	64.3	24	8	64.4	79.0	5.50	+ 0.82	6,055	s.	27	sw	25	9	13	9	11	4.6	4.9	20	11.47	1873	1.27	1886
Montgomery	217	29.76	29.99	0.59	72.2	− 1.8	89	82.6	45	61.9	30	7	58.5	69.2	10.19	+ 6.17	3,536	e.	29	sw.	3	8	15	8	15	4.3	4.5	18	10.25	1873	0.82	1877
Meridian	358	29.61	29.99	0.54	70.0	......	89	80.8	41	59.1	34	12	59.4	73.0	7.42	......	3,389	s.	38	w.	3	11	14	6	13	4.2	3.1	1	.....	....	.....	....
Vicksburg	222	29.72	29.95	0.55	71.7	− 2.3	88	80.7	50	62.7	28	9	60.6	72.2	7.58	+ 2.62	4,406	se.	42	ne.	5	13	12	6	10	4.6	4.1	19	13.23	1872	0.16	1874
University	......	......	......	....	68.9	......	88	78.6	45	59.2	28	11	......	....	7.30	......	......	n.	....	......	...	6	23	2	11	...	...	3	7.30	1890	1.94	1889
New Orleans	52	29.92	29.98	0.50	74.4	− 0.6	87	81.9	59	66.8	20	7	65.0	77.6	5.32	− 0.23	5,761	se.	35	nw.	5	8	11	12	14	4.6	4.9	20	18.68	1873	0.22	1874
Port Eads	......	......	......	....	73.6	......	81	78.5	65	68.8	15	4	......	....	6.93	......	......	se.	....	......	...	5	12	14	11	...	...	3	6.93	1890	0.41	1881
Western Gulf States.					**72.2**	**− 1.0**									**4.68**	**− 0.10**																
Shreveport	249	29.67	29.92	0.50	73.2	− 1.8	92	82.9	53	63.6	29	9	61.7	72.2	1.95	− 2.77	5,086	se.	34	n.	19	7	17	7	9	4.1	4.5	19	14.47	1884	0.08	1886
Fort Smith	492	29.42	29.93	0.50	69.0	− 1.0	89	80.3	46	57.6	36	8	55.6	68.2	5.36	+ 1.31	4,541	e.	38	ne.	19	15	10	6	14	4.7	4.0	8	6.51	1887	0.38	1886
Little Rock	309	29.61	29.94	0.55	69.1	− 1.9	87	78.4	46	59.8	27	7	58.0	71.5	6.16	+ 0.50	4,136	s.	28	se.	31	18	6	7	10	3.7	4.1	11	15.91	1882	1.13	1886
Corpus Christi	20	29.90	29.92	0.44	75.7	......	91	80.3	58	71.1	21	4	70.1	81.9	2.40	......	10,260	se.	54	nw.	25	6	13	12	6	5.5	4.8	4	8.72	1888	1.26	1887
Galveston	44	29.92	29.96	0.45	75.0	− 1.0	85	79.7	63	70.3	18	5	67.3	78.4	5.38	+ 1.00	8,822	s.	40	ne.	5	16	12	3	8	4.3	4.4	20	10.27	1876	0.03	1886
Palestine	511	29.40	29.94	0.44	72.3	+ 0.3	88	82.5	50	62.1	33	12	60.6	71.7	6.85	+ 0.07	4,697	s.	24	n.	5	14	13	4	10	4.3	2.8	9	17.25	1884	0.30	1886
San Antonio	781	29.13	29.94	0.48	74.3	− 0.7	93	83.3	55	65.4	26	7	62.7	57.9	2.39	− 1.26	5,879	se.	51	n.	24	11	12	8	8	6.6	4.0	13	7.92	1885	0.29	1883
Rio Grande Valley.					**79.7**	**− 0.3**									**2.84**	**− 0.58**																
Brownsville	57	29.85	29.91	0.46	78.4	− 0.6	94	85.5	64	71.3	20	8	71.2	83.0	3.33	− 0.25	5,947	se.	36	nw.	13	12	17	2	6	3.6	4.2	15	7.17	1885	0.05	1879
Rio Grande City	230	29.69	29.93	0.48	81.0	0.0	100	91.9	62	70.0	29	10	68.2	72.7	2.36	− 0.91	6,548	se.	30	w.	13	10	16	5	6	5.5	4.6	14	10.28	1885	0.16	1889
Ohio Val. & Tenn.					**64.6**	**− 1.8**									**4.24**	**+ 0.32**																
Chattanooga	783	29.18	30.00	0.61	68.0	− 1.0	89	78.0	40	58.0	30	4	56.6	72.0	3.95	− 0.40	3,206	sw.	27	nw.	7	12	13	6	13	4.1	4.0	12	6.57	1887	1.51	1879
Knoxville	980	28.98	30.01	0.57	66.3	− 0.7	88	76.6	37	56.0	35	7	54.8	72.6	4.34	+ 0.52	3,895	sw.	26	sw.	13	13	9	9	15	5.0	4.1	20	7.19	1885	1.14	1881
Memphis	349	29.60	29.97	0.59	69.4	− 1.6	89	78.6	48	60.2	27	6	57.4	71.2	4.42	+ 0.06	4,897	s.	42	nw.	10	12	16	3	12	4.1	3.7	20	9.14	1882	0.63	1874
Nashville	553	29.41	29.98	0.63	65.8	− 2.2	89	75.6	37	56.0	31	6	53.8	69.1	4.16	+ 0.65	3,448	s.	34	sw.	10	10	12	9	14	5.9	5.1	20	7.38	1882	1.25	1877
Lexington	......	28.86	......	0.60	63.2	......	86	71.5	39	55.0	29	2	52.0	69.8	4.71	......	8,381	sw.	48	sw.	10	7	16	8	13	6.6	5.7	7	6.05	1873	0.79	1874
Louisville	551	29.38	29.96	0.66	64.8	− 2.2	88	74.5	39	55.0	34	7	50.1	62.8	3.15	− 0.60	5,449	sw.	30	sw.	10	11	9	11	11	4.8	4.8	19	7.46	1882	1.00	1876
Indianapolis	766	29.12	29.94	0.69	61.6	− 2.4	87	70.5	39	52.7	28	4	47.0	62.6	3.61	− 0.54	4,164	se.	30	sw.	24	7	13	11	19	6.2	5.5	20	8.22	1880	1.59	1871
Cincinnati	628	29.30	29.97	0.69	63.8	− 1.2	89	74.5	39	53.2	33	11	49.8	64.8	3.58	+ 0.05	5,012	sw.	34	sw.	10	9	9	13	15	6.3	5.5	20	8.47	1882	1.25	1876
Columbus	837	29.06	29.96	0.70	60.0	− 3.0	86	69.0	35	51.1	32	5	50.0	71.7	5.12	+ 0.38	4,110	s.	42	w.	18	8	11	12	17	6.5	6.1	12	9.59	1882	2.00	1881
Pittsburgh	847	29.05	29.95	0.62	62.0	− 2.0	86	71.4	37	52.5	36	9	55.0	81.8	5.85	+ 2.78	3,168	sw.	25	n.	23	6	8	17	20	7.2	6.3	20	6.45	1889	0.98	1871
Parkersburgh	638	29.29	29.97	0.63	61.7	......	87	71.9	36	51.5	36	6	52.9	75.3	6.57	......	3,598	sw.	32	sw.	24	9	6	16	22	6.5	5.7	2	6.57	1890	2.80	1889
Lower Lake Region.					**54.1**	**− 3.4**									**5.32**	**+ 2.19**																
Buffalo	690	29.18	29.92	0.68	52.0	− 2.0	79	59.6	34	44.3	30	3	43.2	74.3	6.13	+ 3.07	6,992	sw.	48	sw.	17	5	19	7	21	6.1	5.5	20	6.89	1882	0.53	1877
Oswego	335	29.58	29.94	0.73	50.8	− 4.2	77	58.0	33	43.5	30	4	42.6	76.2	4.61	+ 2.01	6,860	w.	39	s.	25	5	12	14	19	6.9	6.5	20	7.03	1883	0.54	1877
Rochester	622	29.28	29.95	0.68	53.6	− 3.4	78	62.2	30	45.0	33	4	42.6	69.8	6.00	+ 3.04	6,091	nw.	42	w.	17	4	13	14	23	6.5	6.2	20	6.53	1883	1.17	1887
Erie	714	29.17	29.93	0.69	53.2	− 3.8	79	61.7	34	44.8	35	6	47.2	79.8	6.40	+ 3.02	7,579	w.	37	ne.	10	5	9	17	20	6.3	6.3	17	6.40	1890	1.04	1879
Cleveland	751	29.15	29.96	0.74	55.8	− 2.2	82	63.8	32	47.8	33	5	47.0	73.5	6.16	+ 3.01	5,733	se.	35	ne.	10	9	11	11	21	6.5	5.7	20	6.50	1883	0.67	1877
Sandusky	629	29.26	29.94	0.75	57.7	− 3.3	84	64.8	34	48.6	32	4	46.4	71.4	5.28	+ 2.04	5,652	sw.	32	n.	10	5	11	15	17	6.7	5.8	12	7.11	1882	0.98	1881
Toledo	673	29.23	29.95	0.77	56.2	− 3.8	86	64.8	35	47.6	30	6	44.8	69.3	4.04	+ 0.75	5,135	sw.	30	ne.	10	8	12	11	16	6.4	5.6	20	5.69	1883	0.45	1881
Detroit	662	29.22	29.94	0.76	54.6	− 4.4	84	62.8	32	46.3	30	5	44.0	72.2	3.94	+ 0.56	7,162	w.	32	sw.	17	9	11	11	13	6.1	6.0	13	5.83	1875	0.90	1877
Upper Lake Region.					**47.5**	**− 4.6**									**4.01**	**+ 0.62**																
Alpena	609	29.24	29.91	0.82	45.5	− 4.5	78	52.7	26	38.3	39	5	36.4	72.0	3.74	+ 0.18	7,232	*	38	w.	17	2	9	20	21	7.9	7.6	18	7.36	1880	0.64	1877
Escanaba	608	......	......	....	44.4	− 5.6	77	53.7	22	35.2	28	8	......	....	3.41	− 0.15	......	n.	....	......	...	5	11	15	16	...	...	19	7.91	1881	0.63	1877
Grand Haven	621	29.23	29.91	0.83	50.4	− 4.6	78	57.4	28	43.5	23	5	40.6	72.4	5.32	+ 2.04	8,512	s.	39	s.	16	6	12	13	15	6.5	7.0	19	6.02	1883	1.17	1885
Lansing	883	28.99	29.94	0.82	53.8	......	84	63.3	30	44.2	30	5	41.8	69.3	5.53	......	5,937	sw.	28	w.	18	7	13	11	19	6.2	5.6	4	5.53	1890	1.75	1887
Manistee	615	29.23	29.91	0.81	47.9	......	78	54.1	30	41.7	27	1	38.6	72.4	3.17	......	5,946	s.	30	sw.	17	13	11	7	16	4.8	5.5	2	3.62	1889	3.17	1890
Marquette	735	29.11	29.91	0.91	42.2	− 6.8	78	49.3	24	35.2	38	2	35.2	77.6	2.96	+ 0.16	6,720	nw.	37	se.	24	2	18	11	18	5.8	6.5	20	6.60	1872	0.84	1877
Port Huron	639	29.26	29.95	0.80	50.8	− 2.2	76	58.9	34	42.7	33	2	41.1	73.0	4.30	+ 1.18	8,803	s.	40	w.	17	8	13	10	19	6.2	5.4	16	5.69	1883	1.32	1879
Sault de Ste. Marie	642	29.20	29.90	0.86	43.4	......	72	51.6	24	35.3	26	6	33.8	73.6	3.87	......	6,370	nw.	36	nw.	10	1	7	23	20	7.6	6.9	2	3.87	1890	2.54	1889
Chicago	824	29.04	29.92	0.79	53.4	− 3.6	86	61.5	34	45.2	35	6	42.3	70.8	5.13	+ 1.47	13,538	ne.	59	ne.	10	8	10	13	16	5.7	6.2	20	7.32	1883	1.00	1886
Milwaukee	699	29.15	29.90	0.86	50.0	− 4.0	84	58.2	32	41.9	32	6	40.0	72.0	4.95	+ 1.71	8,766	n.	42	sw.	16	6	12	13	16	5.1	6.8	20	8.54	1876	0.41	1885
Green Bay	616	......	......	....	......	......	....	......	.....	......	....	....	......	....	......	......	......	......	....	......	...	...	...	...	...	...	...	4	3.79	1888	0.90	1887
Duluth	672	29.16	29.91	0.79	43.2	− 5.8	76	50.0	29	36.5	40	2	32.2	70.4	2.24	− 1.59	5,149	ne.	27	sw.	2	5	13	13	17	6.3	6.6	20	7.99	1879	1.40	1871
Extreme Northwest.					**50.0**	**− 4.8**									**1.07**	**− 1.11**																
Moorhead	926	28.87	29.89	1.02	48.0	− 6.0	84	60.5	14	35.5	42	8	33.6	61.0	1.42	− 1.46	9,041	n.	44	ne.	29	8	8	15	13	5.5	4.7	10	5.32	1882	1.42	1890
Saint Vincent	804	29.03	29.92	0.99	45.2	− 6.8	82	57.7	15	32.8	44	6	32.4	64.4	1.29	− 0.85	8,088	n.	40	w.	22	3	19	9	8	4.8	5.9	10	4.00	1881	0.28	1888
Bismarck	1,681	28.11	29.91	0.96	51.3	− 4.7	83	63.7	27	38.9	45	8	45.6	81.7	0.57	− 2.13	11,494	nw.	60	nw.	25	14	11	6	9	3.6	4.2	16	5.74	1876	0.35	1889

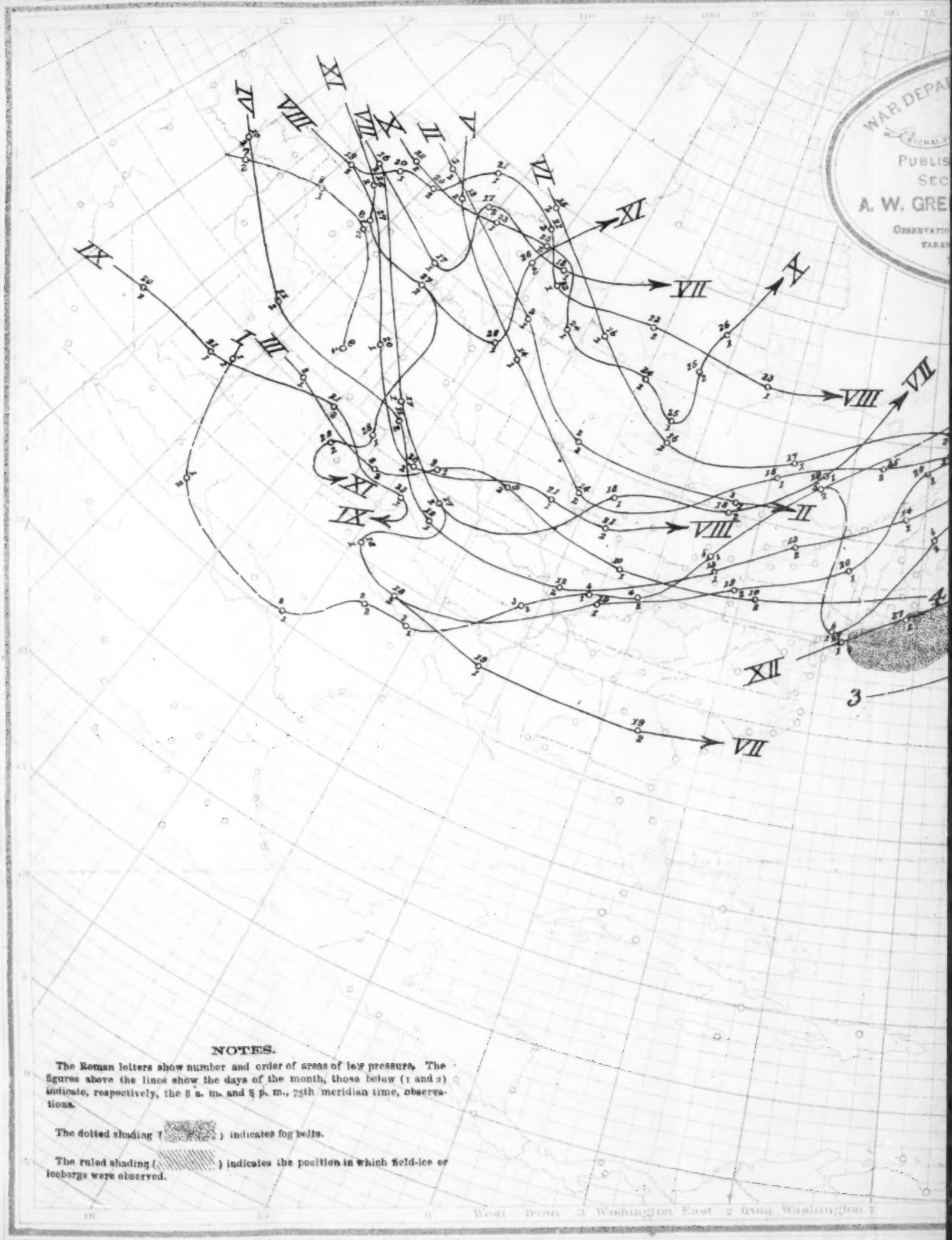
Table of miscellaneous meteorological data for May, 1890—Signal Service observations—Continued.

Stations and districts.	Elevation above sea-level, feet.	Pressure, in inches.			Temperature of air, in degrees Fahrenheit.									Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal precipitation.	Wind.				Cloudless days.	Partly cloudy days.	Cloudy days.	Days with rainfall.	Average cloudiness, tenths.		Precipitat'n data since opening of station.			
		Mean actual.	Mean reduced.	Monthly range.	Monthly mean.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Greatest daily range.	Least daily range.					Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.					8 a. m.	8 p. m.	Length of record, years.	Greatest for month.	Year.	Least for month.	Year.
Ex. northwest—Con.																															
Fort Buford	1,900	27.87	29.89	1.12	50.8	— 4.2	83	62.5	24	39.1	43	5		32.8	55.4	1.58	— 0.22	9,197	nw.	54	nw.	28	4	12	15	13	6.0	6.5	12	5.56	1879	c. 14	1884
Fort Yates	.....	.....	.....	.....	54.9	— 2.1	87	68.9	27	40.9	48	11		.....	.....	0.49	— 0.91	.....	nw.	....	.....	...	2	24	5	8	...	...	7	3.29	1889	0.49	1890
Upper Miss. Valley.					59.7	— 4.1										4.25	+ 0.10														
Saint Paul	831	28.97	29.87	0.72	52.2	— 6.8	86	62.4	27	42.1	43	7		37.6	61.5	3.66	+ 0.34	5,798	nw.	35	nw.	16	6	17	8	14	6.3	6.0	20	7.18	1879	0.82	1886
La Crosse	736	29.12	29.90	0.80	53.4	— 6.6	83	63.4	29	43.5	36	6		39.3	63.4	4.20	+ 1.00	5,115	s.	45	se.	22	4	18	9	14	5.1	6.0	18	6.20	1888	0.50	1887
Davenport	613	29.26	29.91	0.70	58.0	— 3.0	90	68.0	33	47.9	31	3		43.8	63.8	4.33	— 0.06	7,290	sw.	38	sw.	16	9	13	9	17	5.1	5.5	19	9.23	1888	1.34	1881
Des Moines	869	28.96	29.88	0.78	56.4	— 3.6	89	69.7	32	47.1	43	6		43.2	61.8	3.00	— 2.29	7,626	nw.	36	sw.	16	12	13	6	12	4.4	5.3	12	9.76	1883	1.70	1885
Dubuque	651	29.19	29.90	0.76	56.4	— 4.6	90	65.9	30	46.8	35	3		48.0	75.2	5.36	+ 1.41	4,513	se.	25	nw.	9	5	17	9	12	5.2	5.8	17	7.13	1883	1.08	1874
Keokuk	613	29.28	29.93	0.64	60.0	— 3.0	90	70.4	35	49.7	33	7		48.0	68.2	3.34	— 0.73	4,982	s.	24	nw.	10	16	5	10	12	3.9	4.4	19	7.11	1882	1.35	1881
Cairo	359	29.58	29.90	0.64	66.0	— 2.0	88	74.8	42	57.3	26	5		54.0	69.8	4.19	+ 0.26	5,659	s.	36	se.	24	12	13	6	13	4.0	4.6	19	10.22	1882	1.37	1887
Springfield, Ill.	644	29.25	29.93	0.65	60.0	— 4.0	89	70.4	35	49.7	36	4		49.1	70.6	4.33	— 0.83	5,566	s.	41	e.	12	11	14	6	11	4.8	4.8	11	10.59	1882	1.92	1887
Saint Louis	571	29.30	29.97	0.60	63.8	— 3.2	90	73.5	37	54.2	31	5		50.8	65.8	5.81	+ 1.78	8,469	sw.	49	s.	23	16	9	6	15	3.6	4.3	20	7.84	1886	0.95	1879
Missouri Valley.					58.3	— 2.7										2.98	— 1.74														
Columbia	.....	.....	.....	0.53	63.3	.....	90	76.5	33	50.1	36	13		.....	....	3.92	.....	5,202	se.	30	w.	22	9	9	13	13	...	4.4	1	.....	.....	.....	.....
Kansas City	963	28.90	29.92	0.65	63.6	.....	97	73.8	36	53.3	35	7		48.0	62.8	3.31	.....	6,540	s.	34	n.	12	8	15	8	13	4.3	4.4	2	8.98	1889	3.31	1890
Springfield, Mo.	1,356	28.51	29.93	0.47	64.6	.....	88	75.4	36	53.7	32	8		51.5	70.3	3.81	— 3.77	6,983	se.	40	sw.	12	11	9	11	16	5.2	4.6	5	8.07	1882	3.81	1890
Leavenworth	842	29.04	29.92	0.65	63.0	— 2.0	88	73.9	36	52.0	38	9		53.0	73.1	4.10	— 1.02	5,727	s.	30	sw.	9	5	12	14	18	4.8	5.1	19	9.90	1889	1.60	1874
Topeka	.....	.....	.....	.....	62.5	.....	88	76.3	32	48.7	44	13		.....	.....	3.50	.....	.....	s.	.....	.....	...	6	22	3	15	.....	.....	3	6.06	1889	0.87	1888
Omaha	1,113	28.73	29.91	0.66	60.1	— 2.9	89	71.0	33	49.2	37	9		42.8	58.4	2.72	— 2.00	7,730	nw.	40	nw.	22	7	18	6	12	5.1	5.1	20	11.29	1883	1.24	1874
Crete	.....	.....	.....	.....	59.8	.....	88	73.5	28	46.0	45	16		.....	.....	3.46	.....	.....	s.	....	.....	...	15	11	5	10	.....	.....	3	5.01	1888	3.40	1890
Valentine	2,613	27.20	29.92	0.73	55.2	.....	91	68.0	26	42.3	46	6		37.5	55.0	1.91	— 3.16	10,464	n.	48	n.	5	11	13	7	10	3.5	5.0	5	9.35	1888	1.91	1890
Sioux City	1,158	28.62	29.85	0.68	57.8	.....	88	69.9	30	45.7	40	5		40.2	57.0	2.29	.....	8,533	s.	43	s.	27	8	14	9	12	5.0	4.0	1	.....	.....	.....	.....
Fort Sully	1,600	28.19	29.88	0.92	55.8	.....	90	69.1	29	42.5	47	9		36.0	50.6	1.27	— 1.19	9,941	nw.	52	n.	12	11	13	7	8	3.9	5.2	13	5.05	1874	0.36	1884
Huron	1,307	28.47	29.86	0.82	54.0	— 2.0	92	68.1	23	39.8	43	6		35.8	54.2	2.88	— 0.69	8,801	nw.	50	n.	2	10	14	7	14	5.4	4.1	9	5.20	1885	1.39	1887
Yankton	1,232	28.56	29.86	0.75	56.2	— 3.8	88	68.0	32	44.5	36	3		40.8	58.9	4.18	— 0.33	8,918	nw.	54	s.	28	7	11	13	13	0.2	5.3	18	9.88	1881	1.28	1887
Northern Slope.					53.4	+ 0.2										1.27	— 1.84														
Ft. Assiniboine	2,690	27.10	29.90	0.88	52.6	— 0.4	80	65.8	30	39.4	43	4		32.8	53.8	0.78	— 0.49	9,104	nw.	45	nw.	23	6	13	12	8	5.6	6.1	10	3.15	1889	0.43	1885
Fort Custer ‡	3,040	26.74	29.86	1.00	55.4	+ 0.4	88	68.5	30	42.2	43	17		36.5	55.2	1.03	— 1.25	7,130	nw.	48	n.	27	7	14	10	13	6.0	6.0	11	5.63	1880	0.47	1885
Fort Maginnis	4,340	.....	.....	.....	50.6	+ 0.6	74	62.6	27	38.6	39	10		.....	.....	2.03	+ 0.83	.....	nw.	.....	.....	...	7	13	11	14	.....	.....	8	3.21	1888	0.43	1885
Helena	4,069	25.81	29.93	0.76	54.0	+ 2.0	82	63.6	32	44.3	41	4		29.2	47.8	1.43	+ 0.08	5,945	w.	36	w.	28	8	7	16	17	6.8	6.4	11	2.96	1888	0.40	1886
Rapid City	3,280	26.55	29.90	0.89	53.7	.....	90	65.8	28	41.6	40	9		33.4	50.2	2.46	— 3.48	8,159	n.	38	n.	5	4	22	5	12	4.4	5.9	6	11.02	1883	2.02	1881
Cheyenne	6,105	23.97	29.89	0.45	51.7	— 0.3	80	64.5	28	38.9	38	9		31.2	54.0	0.81	— 1.35	8,178	nw.	45	n.	8	6	19	6	8	5.1	6.2	20	4.83	1884	0.32	1886
Fort McKinney ‡	5,000	24.90	29.89	0.70	51.8	.....	86	63.4	27	40.1	36	8		40.9	71.1	1.83	.....	7,009	nw.	54	n.	27	4	14	13	15	5.9	5.6	3	6.82	1888	0.79	1889
Fort Washakie	5,580	24.40	29.91	0.58	52.3	.....	80	66.7	28	37.9	43	10		26.2	45.9	0.46	— 4.18	5,347	sw.	49	nw.	3	10	16	5	7	3.0	5.4	5	5.77	1882	0.46	1890
North Platte	3,841	27.01	29.92	0.68	58.1	— 0.9	92	71.3	28	44.9	45	12		41.8	58.6	0.90	— 2.22	8,719	nw.	40	nw.	5	6	24	1	8	4.0	5.5	16	4.93	1888	0.81	1887
Middle Slope.					63.4	+ 0.8										1.91	— 2.20														
Colorado Springs	.....	.....	.....	.....	55.2	.....	85	68.3	30	42.0	38	8		31.0	50.6	1.43	— 1.87	.....	.....	.....	.....	...	10	16	5	8	3.8	5.4	6	5.90	1874	1.03	1875
Denver	5,281	24.71	29.87	0.56	57.7	+ 0.7	85	71.0	32	44.4	35	12		34.5	51.6	2.01	— 0.77	5,199	ne.	36	n.	18	5	19	7	12	4.3	6.2	19	8.57	1876	0.09	1886
Pueblo	4,753	25.19	29.90	0.55	59.4	.....	89	73.1	36	45.6	42	9		33.4	47.6	1.71	.....	5,958	e.	32	w.	9	9	19	3	7	3.6	5.1	2	1.71	1890	1.40	1889
Concordia	1,410	28.43	29.91	0.71	62.8	.....	87	75.4	31	50.1	41	7		46.4	60.6	2.26	— 2.08	7,233	s.	38	s.	20	14	17	6	7	5.5	5.4	6	6.08	1887	2.26	1890
Dodge City	2,523	27.30	29.88	0.67	63.6	+ 0.6	94	76.7	36	50.5	42	11		47.8	61.6	1.19	— 2.70	10,351	ne.	51	sw.	20	14	16	1	5	4.1	3.0	16	12.82	1881	0.40	1886
Wichita	1,360	28.47	29.90	0.57	64.5	.....	90	76.2	36	52.8	35	11		50.0	64.0	2.17	.....	7,518	n.	36	s.	28	10	16	5	13	5.2	3.7	2	3.88	1889	2.17	1890
Fort Reno	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	.....	.....	.....	8	9.84	1885	0.35	1886
Fort Supply	.....	.....	.....	.....	66.8	+ 0.8	89	79.0	34	54.7	44	13		.....	.....	2.29	— 2.38	.....	s.	....	.....	...	9	19	3	6	.....	.....	9	7.84	1883	0.10	1886
Fort Elliott	3,690	27.17	29.91	0.56	65.4	+ 0.4	90	77.5	36	53.2	37	5		49.4	62.4	1.69	— 3.30	10,599	s.	48	s.	8	12	15	4	7	4.5	3.9	11	7.48	1882	0.23	1886
Southern Slope.					70.1	— 0.2										2.35	— 0.26														
Fort Sill	1,200	28.66	29.90	0.53	68.7	— 0.3	88	80.0	42	57.4	37	12		58.1	76.4	4.46	— 0.01	8,410	s.	38	s.	8	13	14	4	11	3.8	2.5	13	9.74	1882	0.07	1886
Abilene	1,748	28.12	29.90	0.50	72.0	0.0	95	82.3	47	61.7	33	14		58.1	68.2	2.69	+ 0.05	9,196	s.	38	e.	24	19	10	2	6	3.4	2.8	5	3.95	1887	0.33	1886
Fort Stanton	6,150	23.93	29.76	0.32	61.0	.....	85	75.9	36	46.2	41	12		22.0	29.2	0.02	— 0.83	4,755	sw.	44	sw.	8	19	12	0	0	0.9	3.0	6	1.73	1884	0.00	1890
Southern Plateau.					68.7	+ 2.0										0.02	— 0.38														
El Paso	3,796	26.10	29.78	0.36	75.2	+ 2.2	99	89.8	52	60.6	38	19		21.3	18.6	T.	— 0.35	5,924	nw.	44	w.	8	27	4	0	0	1.3	2.5	12	1.83	1881	0.00	*
Lava	.....	.....	.....	.....	71.6	.....	92	85.9	44	57.3	40	22		.....	.....	0.00	.....	.....	s.	.....	.....	...	19	6	6	0	.....	.....	6	0.82	1885	0.00	*
Santa Fé	7,026	23.26	29.88	0.31	59.2	+ 3.2	80	72.1	37	46.3	33	9		18.9	26.8	T.	— 0.89	6,094	sw	35	sw.	23	17	13	1	0	1.6	3.1	18	2.31	1881	T.	1890
Fort Apache	5,020	.....	.....	.....	62.0	+ 2.0	93	83.1	34	40.9	50	28		.....	.....	T.	— 0.54	.....	sw.	.....	.....	...	25	5	1	0	.....	.....	12	1.31	1884	0.00	*
Fort Bowie	.....	.....	.....	.....	71.4	+ 2.4	93	83.7	52	59.1	30	20		.....	.....	0.00	— 0.18	.....	sw.	.....	.....	...	22	5	4	0	.....	.....	7	0.46	1888	0.00	1890
Fort Grant	4,860	23.16	29.87	0.30	69.6	+ 2.6	92	81.5	50	57.8	30	13		26.0	21.2	0.01	— 0.32	5,346	w.	28	e.	14	27	3	1	1	1.3	1.8	13	1.16	1883	0.00	*
Fort Thomas	2,710	.....	.....	.....	72.8	+ 3.8	103	93.2	44	52.5	50	20		.....	.....	0.00	— 0.55	.....	w.	.....	.....	...	22	7	2	0	.....	.....	11	2.73	1887	0.00	*
Fort Verde	.....	.....	.....	.....	69.6	+ 1.6	99	87.8	42	51.3	44	21		.....	.....	0.01	— 0.38	.....	w.	....	.....	...	27	3	1	1	.....	.....	14	1.70	1877	0.00	*
Whipple Barracks	5,389	24.69	29.90	0.34	59.2	+ 0.2	86	75.7	34	42.6	44	22		25.6	32.8	0.00	— 0.53	6,071	sw.	36	sw.	7	23	8	0	0	0.9	1.8	15	1.82	1877	0.00	*
San Carlos	.....	.....	.....	.....	72.4	+ 1.4	102	92.6	41	52.3	50	30		.....	.....	0.00	— 0.28	.....	s.	.....	.....	...	29	1	1	0	.....	.....	9	0.71	1882	0.00	*
Wilcox	.....	.....	.....	.....	66.8	+ 2.8	100	88.5	38	45.2	51	21		.....	.....	0.00	— 0.16	.....	w.	.....	.....	...	25	3	3	0	.....	.....	6	0.48	1887	0.00	*
Yuma	141	29.66	29.80	0.43	78.0	0.0	106	94.4	54	61.6	42	19		39.6	33.8	0.00	— 0.04	5,613	w.	36	w.	26	29	2	0	0	0.5	0.6	15	0.44	1884	0.00	*
Keeler	3,622	26.23	29.79	0.54	69.0	.....	94	81.3	39	56.7	31	11		37.2	33.8	0.20	+ 0.12	5,836	*	34	nw.	13	22	6	3	2	1.0	3.1	6	0.30	1888	0.00	*
Middle Plateau.					59.7	+ 3.2										0.84	— 0.51														
Carson City	.....	25.30	.....	0.55	57.6	.....	88	71.5	32	42.5	41	9		31.6	46.4	0.43	.....	.....	.....	....	.....	...	18	8	5	4	2.2	3.3	3	1.72	1889	0.43	1890
Winnemucca	4,340	25.61	29.94	0.62	58.1	+ 3.1	88	70.4	32	45.8	36	7		31.4	46.0	1.30	+ 0.55	7,260	n.	48	sw.	11	9	16	6	9	3.2	4.7	12	1.89	1883	0.14	1886
Fort Du Chesne	4,900	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	.....	.....	.....	3	0.73	1889	0.69	1888
Salt Lake City	4,348	25.58	29.87	0.56	61.3	+ 3.3	84	72.7	40	49.9	32	12		37.8	43.6	0.16	— 1.65	4,272	nw.	26	se.	11	16	11	4	3	2.9	3.7	17	4.30	1876	0.06	1886
Taylor's Ranch	.....	.....	.....	.....	59.0	.....	88	76.6	30	41.4	45	27		.....	.....	0.03	.....	.....	w.	.....	.....	...	15	10	6	2	.....	.....	1	.....	.....	.....	.....
Montrose	5,793	24.23	29.80	0.47	59.6	.....	83	74.1	31	45.1	37	16		21.9	26.6	0.16	— 0.42	5,189	s.	25	sw.	27	17	13	1	3	2.8	4.3	6	0.86	1885	0.07	1887
Northern Plateau.					55.2	+ 1.2										1.53	+ 0.54														
Boisé City	2,730	27.11	29.92	0.68	60.2	+ 1.2	89	73.2	38	47.2	38	12		37.0	49.3	1.64	+ 0.52	3,719	nw.	28	se.	7	14	12	5	6	3.5	3.7	13	3.14	1885	0.07	1881
Baker City	3,430	26.44	29.93	0.70	54.6	.....	85	68.5	27	40.8	42	5		35.9	53.2	1.33	.....	4,432	nw.	25	nw.	27	14	10	7	7	4.1	4.3	1	.....	.....	.....	.....
Spokane Falls	1,921	27.93	29.94	0.79	58.1	+ 1.1	88	70.2	38	46.0	40	5		36.3	52.2	1.58	+ 0.40	3,935	sw.	26	sw.	16	10	7	14	9	4.9	6.0	10	2.11	1883	0.50	1881
Walla Walla	1,018	28.89	29.97	0.88	63.0	.....	90	74.7	40	51.2	35	6		37.8	44.8	1.36	+ 0.71	5,405	sw.	32	sw.	27	15	10	6	7	4.4	3.7	5	4.04	1889	0.21	1888
N. Pac. Coast Region					58.9	+ 1.9										1.34	— 1.88														
Fort Canby †	179	29.87	30.07	0.76	54.0	+ 1.0	73	59.4	44	48.6	26	5		47.6	81.2	1.76	— 0.98	7,260	n.	48	se.	19	5	10	16	12	6.8	5.9	7	4.88	1887	0.49	1888
Neah Bay	.....	.....	.....	.....	53.4	.....	68	63.2	37	43.6	28	10		.....	.....	3.06	— 1.43	.....	sw.	.....	.....	...	6	8	17	7	.....	.....	6	0.20	1884	1.67	1888
Olympia	56	30.00	30.04	0.86	50.4	+ 1.4	82	69.4	34	43.5	40	8		47.2	75.8	0.31	— 2.29	3,043	no.	22	w.	27	17	10	4	3	4.4	2.8	13	5.66	1887	0.21	1888
Port Angeles †	14	30.04	30.05	0.81	51.4	+ 1.4	70	60.8	34	42.0	32	9		45.6	83.4	0.73	— 0.31	3,482	w.	20	w.	27	14	8	9	5	3.8	3.9	7	2.11	1887	0.21	1888
Tatoosh Island†	.....	.....	.....	.....	45.0	— 6.0	66	55.6	30	34.4	.....	.....		.....	.....	2.58	— 2.19	.....	*	.....	.....	...	7	15	9	9	.....	.....	7	8.85	1887	1.63	1888
Astoria	38	.....	.....	.....	57.1	.....	76	64.9	40	49.3	26	8		.....	.....	1.14	— 2.17	.....	w.	.....	.....	...	10	13	8	8	.....	.....	7	7.33	1887	0.79	1888
Portland	80	29.94	30.03	0.82	60.6	+ 1.6	87	72.5	40	48.8	36	10		48.3	71.2	1.08	— 1.39	4,070	nw.	24	sw.	8	15	11	5	9	4.8	3.8	19	6.60	1879	0.68	1888
Roseburgh	523	29.49	30.05	0.63	59.6	+ 2.6	86	72.2	38	46.9	38	5		45.8	66.3	1.11	— 0.62	2,802	nw.	22	n.	24	11	13	7	8	4.6	4.6	13	4.63	1879	0.73	1881
Mid. Pac. Coast Reg.					64.3	+ 1.3										1.86	+ 1.14														
Eureka	64	29.98	30.04	0.58	54.0	.....	78	59.3	41	48.8	26	3		49.0	85.5	1.71	.....	5,775	nw.	35	n.	24	5	14	12	7	6.2	4.5	4	7.20	1889	0.76	1888
Red Bluff	342	29.59	29.93	0.61	67.8	+ 0.8	99	79.6	43	55.9	36	4		53.3	65.6	2.67	+ 1.67	5,286	nw.	36	s.	31	17	8	6	7	4.1	3.3	13	2.96	1883	0.18	1884
Sacramento	64	29.86	29.93	0.56	65.4	+ 1.4	92	75.8	46	55.0	29	4		52.7	71.0	1.80	+ 1.26	6,139	sw.	28	n.	13	17	7	7	5	2.6	2.7	13	3.25	1889	T.	*
San Francisco	60	29.92	29.98	0.54	59.8	+ 1.8	85	67.2	47	52.5	33	2		48.6	75.0	1.07	+ 0.49	7,221	sw.	36	sw.	24	12	14	5	4	5.1	3.5	20	2.35	1879	0.00	1873
Point Reyes Light	.....	.....	.....	.....	53.4	.....	82	60.1	40	46.8	26	3		.....	.....	2.12	.....	.....	nw.	.....	.....	...	17	2	12	5	.....	.....	1	.....	.....	.....	.....
S. Pac. Coast Region.					61.8	— 1.2										0.06	— 0.34														
Fresno	328	29.57	29.92	0.58	69.4	.....	103	83.8	42	55.0	43	12		47.6	55.0	0.45	.....	5,335	nw.	22	nw.	3	19	6	6	3	2.9	2.4	3	0.57	1889	0.45	1890
Los Angeles	330	29.63	29.98	0.37	63.2	— 0.8	90	72.3	43	54.1	37	7		50.6	72.9	0.03	— 0.36	2,666	w.	15	w.	11	5	18	8	2	7.1	3.5	13	2.02	1883	0.01	*
San Diego	93	29.90	30.00	0.30	60.4	— 1.6	73	65.8	46	55.1	25	5		53.0	77.4	0.08	— 0.31	3,433	w.	21	nw.	11	12	7	12	3	3.3	4.8	19	2.17	1884	T.	1879

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record.
* Two or more directions, dates, or years. † Precipitation is measured at the Boston Water Works. ‡ Received too late to be considered in departures, etc.

Form 80c C 1884

Chart I. Tracks of



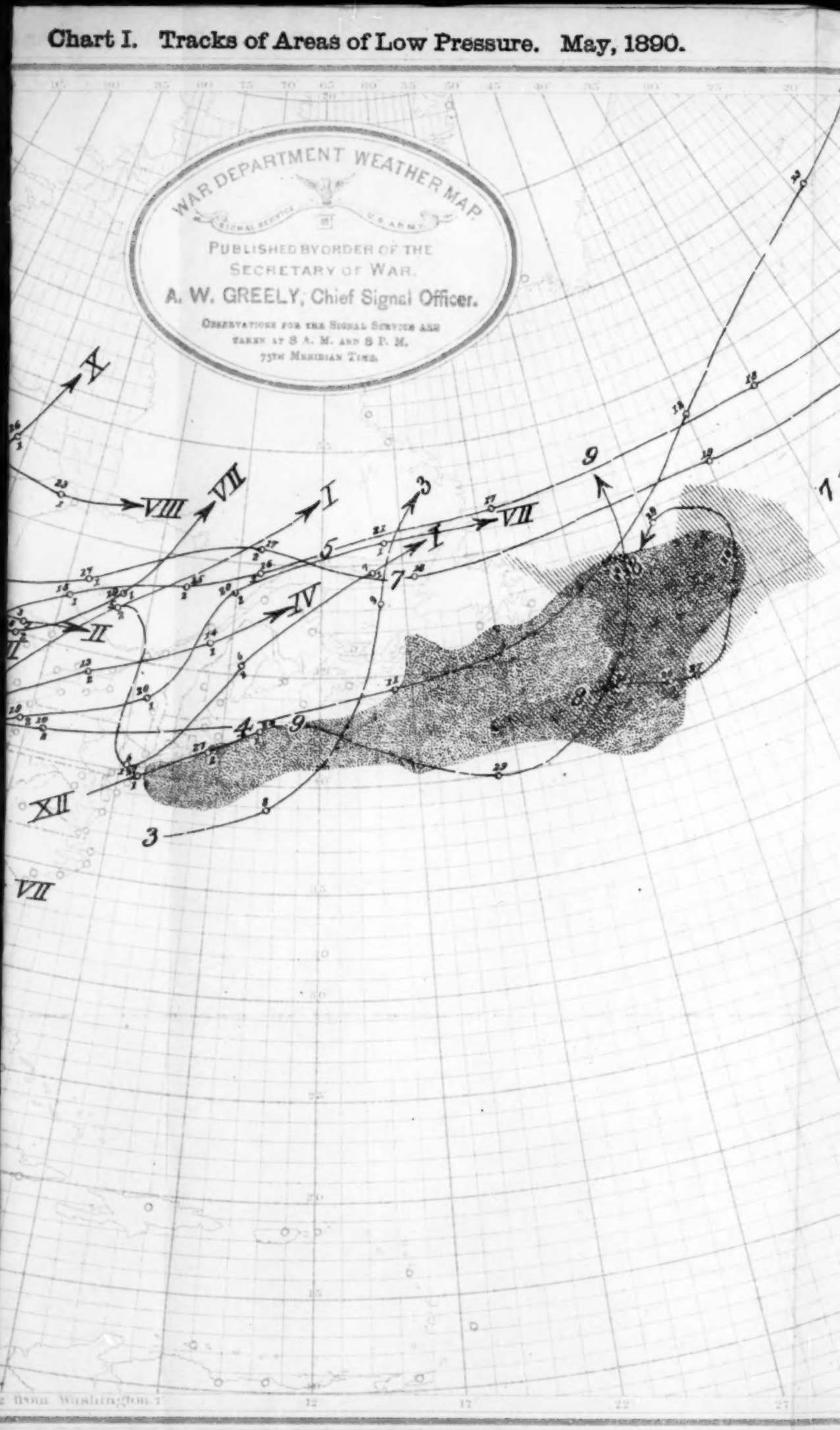
NOTES.

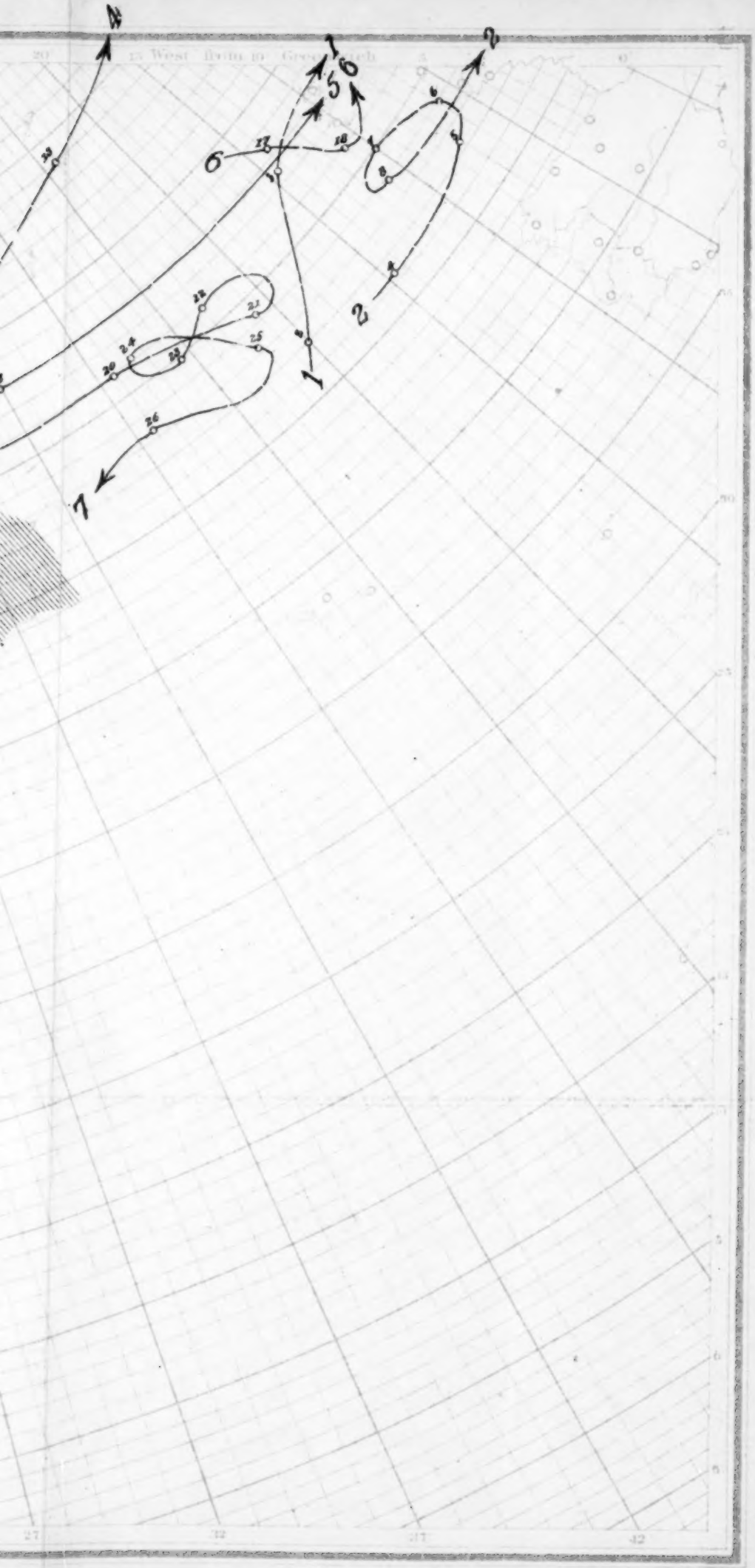
The Roman letters show number and order of areas of low pressure. The figures above the lines show the days of the month, those below (1 and 2) indicate, respectively, the 8 a. m. and 8 p. m., 75th meridian time, observations.

The dotted shading ( ) indicates fog belts.

The ruled shading ( ) indicates the position in which field-ice or icebergs were observed.

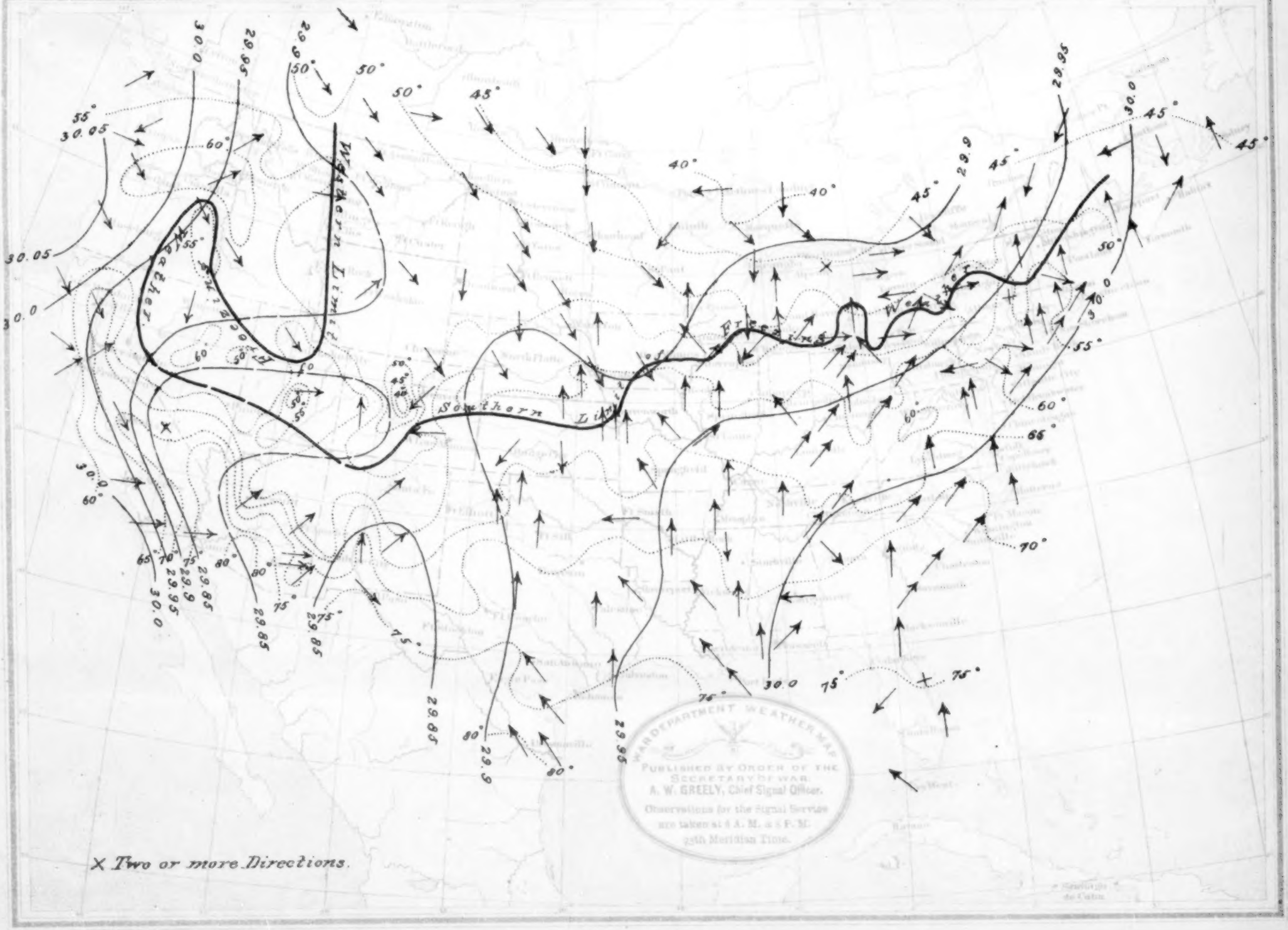
Chart I. Tracks of Areas of Low Pressure. May, 1890.





Signal Office Lith.

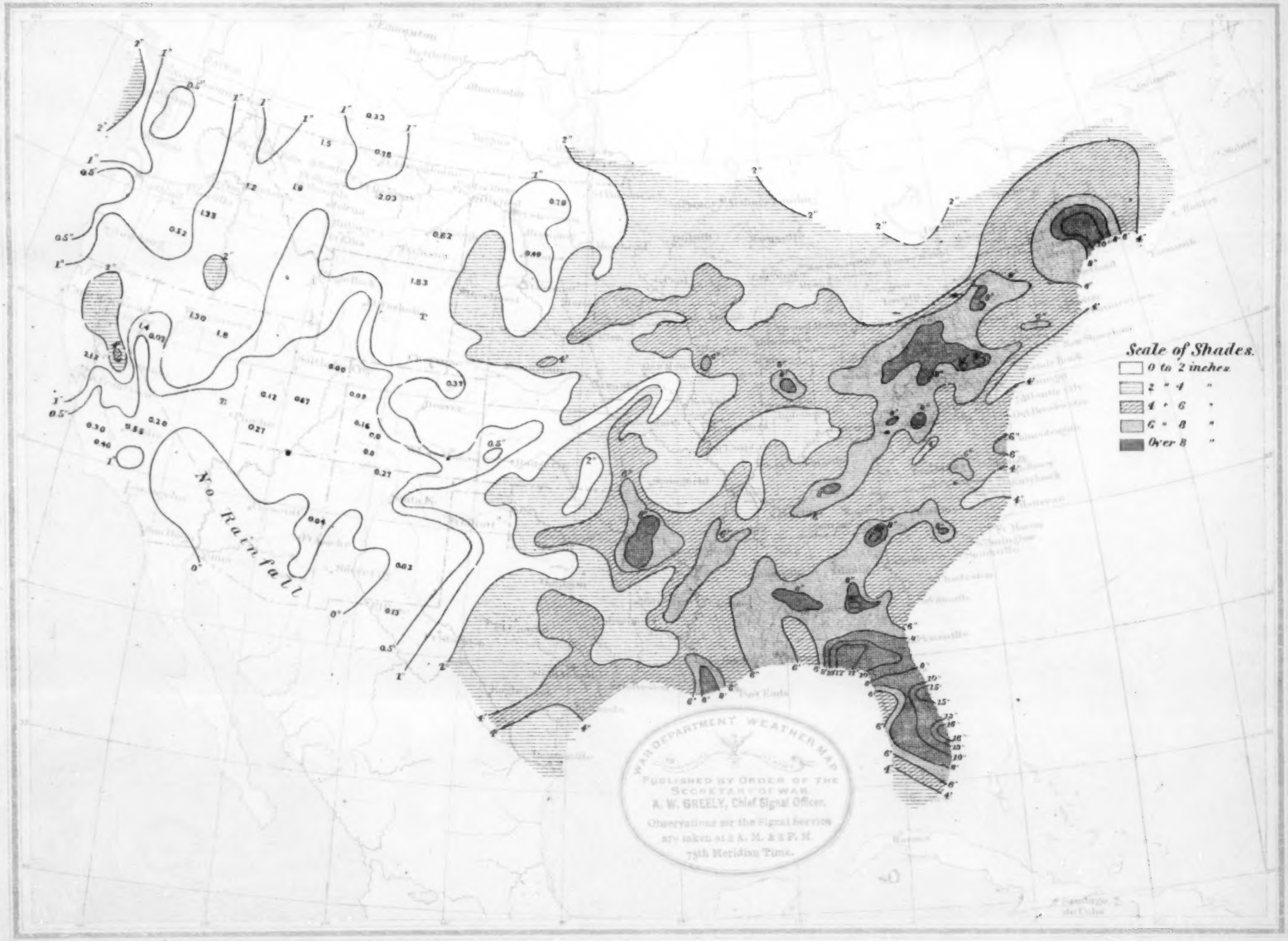
Chart II. Isobars, Isotherms, Winds, and Limits of Freezing Weather, May, 1890.



X Two or more Directions.

Chart III, Precipitation, May 1890.

Form 1041 P



List of merchant marine steam and sailing vessels from which International Meteorological reports were received at the office of the Chief Signal Officer, U. S. Army, Washington City, in time to be used in the preparation of the Monthly Weather Review for May, 1890—Continued.

	Name of vessel.	Captain.
	Sailing vessels—Continued.	
Nor.	bk. Aljuca	J. Anderson.
	schr. Anna E. Krans	T. Newcomb.
Am.	bk. Antioch	C. H. Hemmingway.
	bkt. Bonnie Doon	Chas. Burgess.
	Chestina Redman	E. A. Watts.
	schr. Compeer	L. H. Petersen.
	Ettie H. Lister	S. D. Mason.
	Gertrude	W. H. Cox.
	bk. Glad Tidings	R. Roberts.
Ger.	G. N. Wilcox	W. Rasch.
Am.	bg. H. B. Hussey	G. W. Hodgdon.
Ger.	bk. Hermon	O. Olsen.
Am.	bg. I. W. Parker	John W. Kane.
	bk. Jane Adeline	G. W. Cates.
Am.	schr Jennie S	Chas. Sinclair.
	bk. J. H. Bowers	F. A. Magum.
Nor.	Johan Irgens	I. Iversen.
Am.	bkt. John J. Marsh	F. P. Whittier.
	schr. John R. Bergen	W. H. Squires.
	bkt. Jose E. Moore	A. Leonhard.
Br.	bg. Julia Blake	J. Rudols.
Am.	schr. Kate Church	J. H. Weeks.
Br.	bk. Kanoma	J. Thompson.
Am.	bk. L. F. Munson	J. V. McKowen.
	sp. Light vessel No. 45	Andrew Jackson.
Br.	bk. Lillie Soullard	A. D. Hilton.
	bkt. L. M. Smith	S. J. Smith.
	sp. Micronesia	A. Greig.
Am.	sp. Mindoro	J. W. Luscomb.
	bk. Neptune	J. Fred Hill.
Br.	bkt. Parsee	J. R. Cowen.
Nor.	bk. Qvos	G. Olsen.
Dan.	Rialto	L. P. Jorgenson.
Am.	bg. Robert Mowe	W. Petersen.
	sp. Robert Dixon	G. H. Austin.
	schr. Roger Drury	John Delay.
	sp. Sachem	J. C. Bartlett.
Br.	bk. Star of China	J. McDonald.
	Valona	H. Andrews.
Am.	schr. Warren Adams	C. A. Colcomb.